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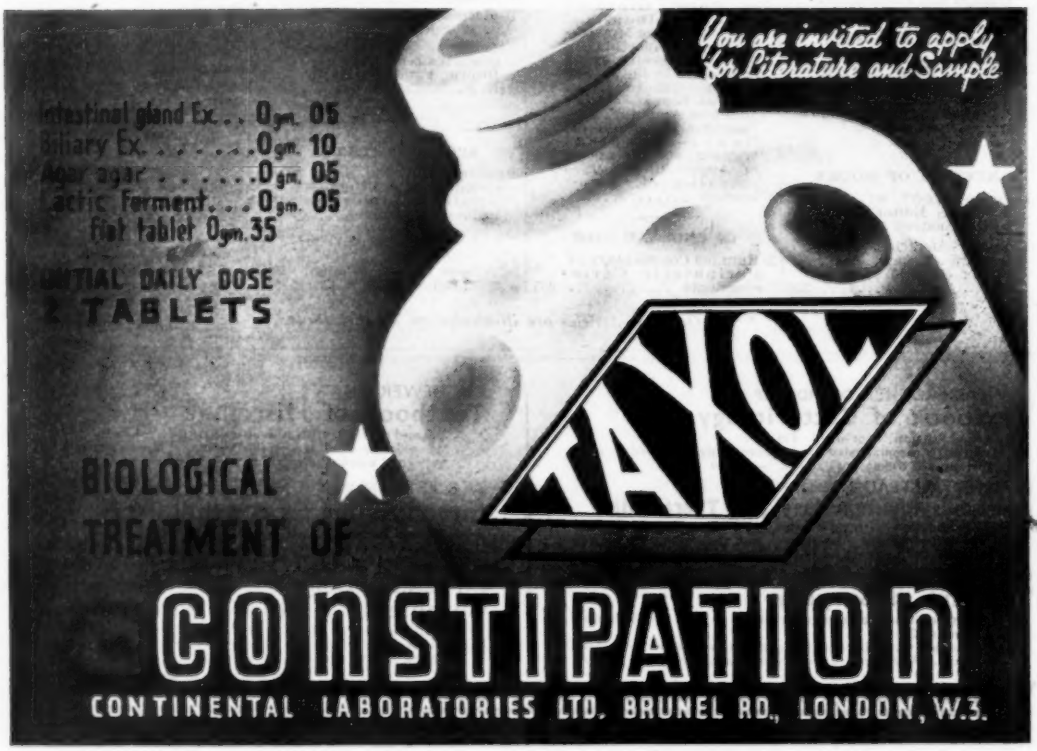
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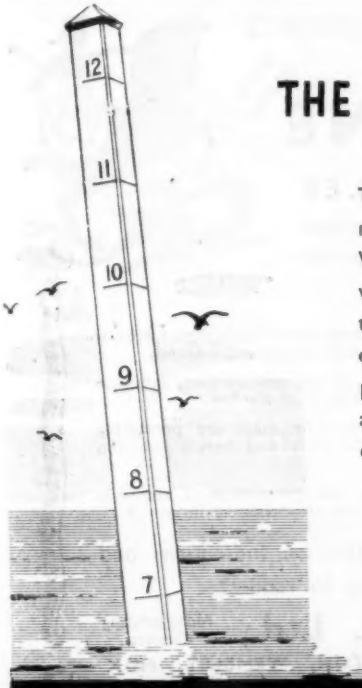

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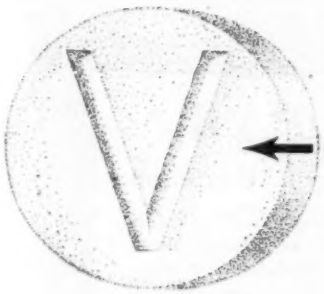

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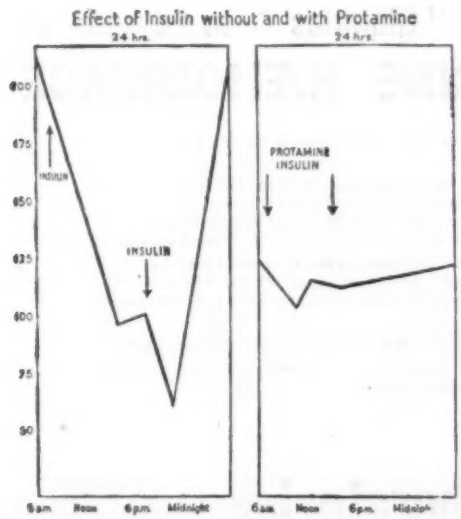

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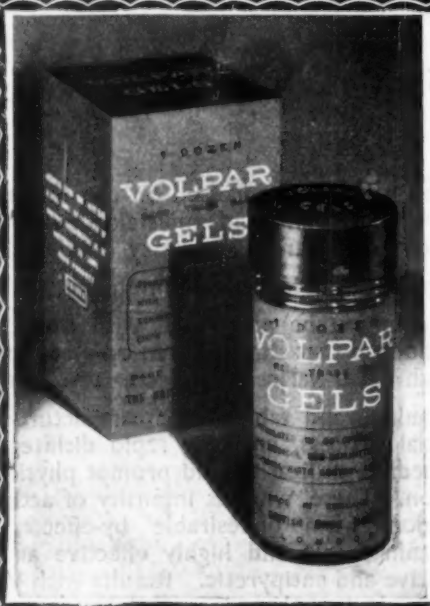

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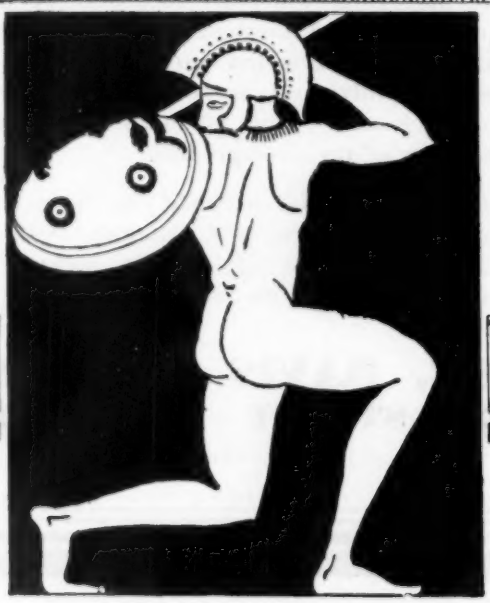

Design from Greek Vase.
A Warrior, running, directing his spear against a Pursuer, who is not shown.

M. 261.

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Brit. Med. J., 1941, May 24th, Page 784.

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Technique The needle should be as fine as possible, short-bevelled for small veins and long-bevelled for large, mobile varices.

Empty vein method This is the method of choice in most cases. With the patient standing, mark with a coloured antiseptic solution the course of the vein to be injected. The patient should then lie down. Apply a tourniquet with sufficient pressure to distend the varicose vein (a sphygmomanometer armlet may be used). Insert the needle through adjacent healthy skin into the distended vein. Release the tourniquet, permitting the vein to collapse before injecting the solution. Apply *light* pressure to the puncture for two minutes, then a dressing. The patient may then walk about as usual but not take violent exercise for 24 hours.

Full vein method When veins are small, or the above technique is inconvenient, injections may be made directly into full veins without application of a tourniquet.

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ORIGINAL ARTICLES

MENINGOCOCCAL ENCEPHALITIS

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MEDICAL SUPERINTENDENT OF THE PARK HOSPITAL, L.C.C.

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MAJOR, R.A.M.C.; DIRECTOR OF RESEARCH AND PATHOLOGICAL SERVICES, L.C.C.

(*Illustrative plate*)

Two recent events have contributed to a clearer understanding of the pathogenesis of meningococcal infection. These are: the step up in virulence and massive infection associated with the high epidemic prevalence of 1940 and 1941; and the rapid clearing of organisms from the blood-stream and the meninges (that is, the rapid cure of the septicæmia and meningitis) produced by the sulphonamide drugs. The first factor, acting especially near the peak of the epidemic in February and March of each year, produced an unusual number of fulminating and severe acute cases for study. The second factor provided a means of investigating causes of death other than septicæmia and meningitis, for in most of the fatal cases, except the most rapid fulminating types, both the septicæmia and the meningitis had been largely cleared up by chemotherapy by the time the patient died. These investigations have added to our knowledge of the incidence, nature and extent of encephalitis and also of adrenal lesions in meningococcal disease. In this paper we indicate our findings in encephalitis and illustrate the main clinico-pathological types with representative case-histories and microphotographs. The subject has already been briefly discussed by one of us (Banks 1940).

Netter and Debré (1911) summarised the early histological studies of meningococcal disease (Klebs 1877, Strumpell 1889, Hagelstam 1893, Flexner and Barker 1894, Councilman, Mallory and Wright 1898). In acute cases they described no conspicuous change in the brain tissue except congestion and œdema and occasionally vacuolisation and chromatolysis of the nerve-cells in the marginal areas close to the meninges. They stated that the essential character of cerebrospinal meningitis is the limitation of inflammatory lesions to the meninges and the integrity of the subjacent nervous tissue. It was early recognised that purulent meningeal exudate might sometimes dip right down into the sulci and extend some distance into the brain or cord as a perivascular infiltration around the larger vessels, but this was a direct extension of the inflammatory process from the meninges rather than a true encephalitis. Boyd (1940) refers to the brain as being "curiously intact." These views have permeated the whole of the literature, and little attention appears to have been given to the histology of the brain in meningococcal meningitis for many years. Encephalitis is just mentioned, however, in the larger textbooks, where it is stated that scanty foci of cellular infiltration, suppuration or hæmorrhage have occasionally been found. Foster and Gaskell (1916) noted a case with deepening coma leading to death in about 5 days, in which there were perivascular hæmorrhages in the cord and cortex of the brain; and Worster-Drought and Kennedy (1919) found in a similar case, dying on the 7th day of illness, an area of softening beginning in the base and encroaching on the head of the caudate nucleus. A recent example of a much more extensive meningococcal perivascular encephalitis is described by Jonesco-Sisesti and Stroesco (1939). In none of these isolated observations is any clinicopathological correlation attempted. Clearly the ordinary form of meningococcal disease is pre-eminently a meningeal infection with occasional scanty involvement of the cerebral tissue itself.

During the epidemic of 1940–41 we observed a number of cases of meningococcal infection quite different from the ordinary form. These were both fulminating and acute.

Fulminating Cases

The fulminating cases were invariably fatal within 24 hours, and were generally divisible into two types—a cerebral or encephalitic type and an adrenal type—though a mixture of the two was also met with. The adrenal type has long been recognised, but its description (the so-called Waterhouse-Friderichsen syndrome) is that of a mixture of types and even of infections.

The pure *fulminating adrenal type* is characterised by sudden onset of fever, rapid deterioration, vomiting, a generalised petechial rash with some larger purpuric elements appearing within a few hours of onset, and the development of grave hypotension with cyanosis. The mental condition is relatively unclouded and may be clear to the end, but only when the infection is restricted to septicæmia with adrenal hæmorrhage. If there is meningitis the patient tends to become irrational or delirious, and if there is encephalitis he becomes stuporose and later deeply comatose.

The *fulminating cerebral type* may be similar in onset and progress up to the development of the rash, or may even begin with coma. The rash does not usually exhibit the larger purpuric elements, and hypotension does not develop, but stupor and coma always come on quickly. The coma rapidly deepens until there is no response to painful stimuli. Respirations become frequent and laboured, grunting or stertorous, but are not associated with pneumonic signs. Cyanosis is usual. In the most rapidly fatal cases (those dying within 15 hours of onset) there are no signs of meningeal irritation, and the spinal fluid is clear. In the less rapid cases there is usually slight neck rigidity with flaccidity elsewhere, and the spinal fluid is turbid and contains meningococci. Blood-cultures nearly always yield a profuse growth of meningococci. In our experience the morbid histology characteristic of this fulminating cerebral type is an early encephalitis, with or without meningitis. The encephalitis affects some portions of the brain more than others. Sections of the brain show intense congestion and œdema with multiple small hæmorrhages around the small blood-vessels and widespread capillary thrombosis (figs. 1A and B). There is no perivascular or meningeal infiltration in the most rapidly fatal cases, but in others not so rapid both are present. The perivascular infiltration is then always slight and usually limited to a single ring of mononuclear cells. In addition to the vascular lesion the nerve-cells show acute degenerative changes, including loss of nuclei and chromatolysis.

These findings indicate an overwhelming toxic effect on the brain rather than a bacterial invasion; there is little evidence of actual multiplication of organisms within the brain. This type of infection contrasts strikingly with the ordinary form of meningococcal disease, where the organism produces its effect by multiplication within the meninges and occasionally in other tissues. Such wholly different reactions to infection with the same kind of organism are well known to the experimental pathologist. Massive doses of organisms of high virulence often produce in laboratory animals a rapid lethal effect which is strikingly different from the ordinary course of the infection produced by injection of ordinary doses of organisms of moderate virulence. Fulminating encephalitis, in our experience, was only seen from late January to early April, 1940, when the epidemic was in its most virulent phase and opportunities for mass infection were highest. We conclude, therefore, on clinical, pathological and epidemiological grounds, that fulminating encephalitis is a rare clinical form of meningococcal infection produced by the overwhelming toxic effect of massive doses of the most highly virulent organisms in the most susceptible subjects, especially infants.

FULMINATING ENCEPHALITIS

CASE 1.—A male child, aged 11 months, admitted at 6 P.M. on Feb. 23, 1940, with a history of fretfulness, vomiting and diarrhœa for 24 hours. Pale and collapsed. Temperature 97° F., pulse-rate 130, respirations 70. Chest clear. No rigidity. Three hours later, cyanosis, rapid laboured respirations and a macular and petechial rash on trunk and limbs; two green stools passed. During the night, rapid deterioration and complete coma, with loss of swallowing reflex; pulse uncountable; T. 104° F.; dyspnœa and cyanosis; no meningeal signs; tendon reflexes absent; spasm of masseters; eyes rotated upwards and divergent squint; pupils reacting; no convulsions. Died 13 hours after appearance of rash.

Autopsy.—Profuse hæmorrhages throughout skin, pericardium, pleura and peritoneum; hæmorrhagic double pleural effusion; no pneumonia; no suprarenal hæmorrhage. Brain showed much congestion and œdema; no meningitis. Section of cortex showed great congestion and œdema, widespread capillary thrombosis, a few capillary hæmorrhages and some perivascular hæmorrhage (figs. IA and B). Some early perivascular infiltration with a few mononuclear cells. Many nerve-cells showed cloudy swelling, chromatolysis and loss of nuclei. (No examination for meningococcus was made in this case because the whole acute phase of the illness took place during the night.)

FULMINATING ENCEPHALITIS AND MENINGITIS

CASE 2.—A male child, aged 5 months, admitted at 8 P.M. on Jan. 21, 1941. Had refused food at noon and passed a loose stool; at 2 P.M. spots had appeared on buttocks; thereafter, rapid deterioration. On admission, profuse purpuric rash on face, trunk and limbs, with large blotches; complete coma; cyanosis; loss of swallowing reflex and response to all stimuli; respirations 100 and laboured; no pneumonia; neck slightly rigid; fontanelle tense and pulsating and unchanged by two lumbar punctures. Cerebrospinal fluid: pressure slightly increased; cells 1080 per c.mm.; meningococci group I present. Fluids were given by stomach-tube, with sodium sulphapyridine 0·5 g. intramuscularly 3-hourly and 60 c.cm. meningococcus antitoxin intraperitoneally. Died 7 hours after admission. Course from onset to death 15 hours.

Autopsy.—Fontanelle and sutures tense; brain soft and very œdematous; slight meningeal exudate at base. Section of cortex showed much congestion and œdema, early capillary thrombosis, scattered small hæmorrhages and around some vessels a fine mononuclear infiltration with a few polymorphs; acute degenerative changes in nerve-cells.

FULMINATING ENCEPHALITIS, MENINGITIS AND ADRENAL HÆMORRHAGE

CASE 3.—A boy, aged 4 years, admitted at noon on April 10, 1940, with diagnosis of pneumonia. Shivering and vomiting began at 4 P.M. on April 9, followed by delirium, coma and stertorous breathing during the night. Purpuric spots seen 3 hours before admission. On admission, profuse generalised purpuric rash with blotches ½ in. in diameter; absolute coma, with loss of swallowing reflex; cyanosis and stertorous breathing; pulse imperceptible; no pneumonia; no neck rigidity; Kernig negative; tendon reflexes absent. CSF pressure moderately raised; cells 4000 per c.mm.; meningococci group I. Given sodium sulphapyridine, 1 g., intravenously. Generalised convulsions set in; died 2 hours after admission.

Autopsy.—Hæmorrhages into skin and serous membranes. Right adrenal contained hæmorrhage 5 mm. in diameter, left adrenal deep purple. Meninges showed slight purulent exudate over vertex and base; brain extremely congested and œdematous. Section of cerebral cortex much congested, with diffuse capillary thrombosis and widespread gross œdema (fig. II); perivascular infiltration in a number of larger vessels near a sulcus; degenerative changes with necrosis of some nerve-cells. Sections of right adrenal showed hæmorrhage occupying three-quarters of the gland, and of left adrenal some hæmorrhage with focal necrosis of cortical cells.

Acute Cases

A widespread encephalitis occurs not only in fulminating but also in some rare acute cases. In the former death takes place within 24 hours and there is little or no meningitis. In the latter death commonly occurs in 5–7 days and there is always purulent meningitis; the condition is an acute encephalomeningitis. Any variation may be seen from the fulminating case which dies in 6 hours from onset to the subacute case which dies in 3 weeks, like that of Jonesco-Sisesti and Stroesco. The acute encephalitic case, like the fulminating, may occasionally be complicated by adrenal hæmorrhage, and in addition there may be time for other focal inflammatory lesions to develop—for example, pericarditis (case 7) or arthritis (case 5). Case 4, which was fatal in 40–48 hours from onset, is an example of an intermediate type between fulminating and acute.

The outstanding clinical sign which is added to the meningeal signs in the acute encephalomeningitic type is deep coma, usually appearing within 36 hours of onset. The coma deepens progressively until there is no response to stimuli. The swallowing reflex may be abolished, or nearly so. Other distinctive clinical features are: (1) rapid laboured or stertorous, and later irregular, breathing with absence of physical signs of pneumonia; (2) cyanosis; (3) contracted pupils; (4) incontinence of urine and fæces; (5) relatively slight neck rigidity, sometimes even associated with general flaccidity; (6) slight papilloedema; (7) an extensor plantar reflex. In our cases seen during the epidemic there was *no rash*, but there was a sparse petechial rash in case 7, seen in January, 1937. The spinal fluid is always purulent and contains meningococci of group I. These cases are almost invariably fatal and correspond roughly to the "acute fatal type" of former writers. We record, however, one recovery (case 6), in which the diagnosis of encephalitis was confirmed by the appearance of a phase of parkinsonism for about a fortnight after recovery of consciousness.

The morbid histology of the acute encephalomeningitic case which has been treated with sulphonamides is as a rule that of a clearing meningitis and a well-marked and widespread perivascular encephalitis in certain regions. Besides congestion of the brain and cord there are, in many parts, capillary thromboses with perivascular cuffing and numerous small hæmorrhages. In the centre of a hæmorrhage a thrombosed capillary may sometimes be seen (fig. IV B). In the more quickly fatal cases, such as case 4, the perivascular cuffing is narrow and mainly mononuclear. Where death is postponed for a few days there are in addition broad zones of polymorphonuclear and large mononuclear cells around some of the larger as well as the smaller vessels, together with perivascular hæmorrhage, fibrin deposition and even myelin destruction. The cuffing may occasionally amount to perivascular abscess. This was well seen in case 7, which occurred before the introduction of sulphonamide treatment. Here the cuffing is almost entirely polymorphic and there is a relative paucity of small and large mononuclears, an indication of a reaction to an active growth of organisms. In the sulphonamide-treated cases, on the other hand, the broad zones of polymorph cuffing are fewer and contain a relatively high proportion of large mononuclears, an indication of some check on the vascular growth of organisms (figs. IV C and D). Though we used suitable stains we have been unable to demonstrate meningococci in the perivascular cuffing of the sulphonamide-treated cases. These vascular and perivascular lesions are scattered regionally at various levels of the brain and cord. They seem to be most common in the neighbourhood of the basal ganglia, midbrain, medulla and upper cord, but are also present in some parts of the cortex. It is only the more advanced lesions that can be seen with the naked eye, and the condition is easily missed at necropsy unless a careful histological examination of different levels of the central nervous axis is made. The lesions appear to be the result of two types of reaction. First, there is the toxic effect of a massive dose of virulent organisms producing widespread hæmorrhage, œdema and capillary thrombosis, as in fulminating cases. Secondly, there is the inflammatory reaction produced by the organisms themselves as they multiply for a time in the vessels. If the disease lasts several days, and if the case is not immediately treated with a sulphonamide, broad zones of polymorphs are formed which may later be partly absorbed or replaced by large mononuclears. The effect of chemotherapy is to clear up partially the inflammatory reaction in the meninges and brain and thus to reveal the cerebral damage caused by the initial onslaught of the virulent organisms.

ACUTE WIDESPREAD ENCEPHALOMENINGITIS

CASE 4. *Rapid type, intermediate between fulminating and acute.*—A man of 45, admitted at 9 P.M. on Sept. 4, 1940, having been found unconscious 4 hours before. On admission was in deep coma with only faint response to gross stimuli; swallowing limited and difficult; cyanosis and stertorous breathing; no pneumonia; pinpoint pupils; T. 100° F.; pulse-rate 120; respirations 28. Blood-pressure 110/100 mm. Hg. Tendon reflexes increased; plantar reflexes extensor; no rash; slight neck rigidity; blood-sugar 109 mg. per 100 c.cm. CSF turbid; pressure raised; meningococci grew. Given sodium sulphathiazole, 2 g., intravenously, then 1·5 g. by stomach-tube 4-hourly; 5% glucose saline rectally by continuous drip. Next morning, still deep coma

and stertor and not swallowing. CSF showed meningococci in films but not in culture. Died at 6 P.M., 25 hours from onset of coma, and 30–48 hours from onset of disease.

Autopsy.—Lungs congested, no pneumonia. Brain showed great tension in dura, purulent meningeal exudate over vertex and slight at base, deep congestion of white matter. Sections of cortex, basal ganglia, midbrain and medulla showed much congestion, œdema, scattered capillary thrombosis and a widespread fine infiltration around the smaller vessels with mononuclears and occasional scanty polymorphs (fig. III A and B). In the midbrain there was a small area of purulent infiltration near the corpora quadrigemina; many of the larger vessels near the meninges showed polymorph perivascular cuffing, probably by direct extension from the meninges.

CASE 5.—A man of 22, admitted at midnight on Feb. 25, 1940. Onset 3 days before; coma for 36 hours. On admission was in deep coma with no response to stimuli and not swallowing; neck rigidity and Kernig present; tendon reflexes exaggerated, abdominal absent; pupils equal and reacting; arthritis right wrist with fluid in the joint; no rash; T. 100·4° F.; pulse-rate 90; respirations 26. CSF: 15,700 cells per c.mm.; meningococci group I in films and culture. Given sodium sulphapyridine, 2 g., intravenously, followed by 2 g. intramuscularly 4-hourly during the night; glucose-saline, 500 c.cm., intraperitoneally. Next morning coma still very deep, but swallowing with difficulty; drug and fluids by mouth; hiccough present. In evening coma still deep; T. 102·8° F.; pulse-rate 120; respirations 44; no pneumonia. CSF: 24,000 cells; no organisms. Died 30 hours after admission, after 66 hours of deep coma and in 5th day of disease.

Autopsy.—All organs including adrenals congested; no pneumonia; meningeal exudate slight and only at base; brain tissue deeply congested with some areas of softening. Sections of cortex showed congestion, œdema, widespread capillary thrombosis, numerous hæmorrhages scattered regionally, some showing a thrombosed capillary in the centre, and broad polymorphic and large mononuclear perivascular cuffing around some of the larger vessels, deep in the brain tissue (figs. IV A, B, C, D). Many of the smaller vessels showed a fine mononuclear perivascular infiltration.

CASE 6. *Recovered.*—A girl of 15, admitted on Sept. 25, 1940. Delirium and coma came on 4 hours after onset of headache and vomiting; taken to general hospital during severe air-raids and given 1 g. sodium sulphapyridine intramuscularly; no further drug given owing to air-raids till admitted to Park Hospital 27 hours later. On admission absolute coma with loss of swallowing reflex and all response to stimuli; incontinent; mouth and tongue dry and dirty; skin dry; dehydrated; neck rigid but otherwise general flaccidity; cyanosis; stertorous breathing; no pneumonia; pupils contracted; no rash; left 6th nerve paresis; pulse rapid. CSF purulent; meningococci group I in films and culture. Given 2 g. sodium sulphathiazole intravenously, followed in 3 hours by 1·5 g. 4-hourly by stomach-tube; continuous drip rectal saline and fluids by tube. Next day still in absolute coma and unable to swallow. CSF: 17,000 cells, no organisms. On 27th coma was still deep and she was unable to swallow, but showed faint response to gross stimuli; all fluids and drug given by tube for 48 hours. Next day able to swallow, but not to speak; double 6th nerve palsy; blurring of edges of optic discs and slight papillœdema. On Sept. 30 rational, with slow cerebration. Completely immobile expression. Able to close her eyes; tendon reflexes brisk and slight ankle-clonus; plantars now flexor.

From Oct. 3 to Nov 1 a series of photographs taken while she attempted to smile show clearly the parkinsonian mask (fig. VII *a*, *b* and *c*). These show also slight right upper-neurone facial paresis. The striking effect was the absence of emotional expression. This was considered to indicate a lesion of the midbrain, probably an encephalitis. The mask-like expression partially cleared up after 2–3 weeks (fig. VII *c*) and wholly cleared in five weeks (fig. VII *d*), but the right 6th nerve paresis persisted for nearly 4 months (fig. VII *d* and *e*).

ACUTE ENCEPHALOMENINGITIS, ADRENAL LESIONS AND PURULENT PERICARDITIS

CASE 7. *Not treated with sulphonamides.*—A man of 24, admitted Jan. 27, 1937. Diagnosed as influenza. Sudden shivering, vomiting, pains and cough 24 hours previously,

a *b* *c* *d* *e*

FIG. VII—Recovered acute encephalomeningitis showing transient parkinsonism. Case 6. (*a*) 9th day of disease; face in repose; bilateral VI nerve paresis. (*b*) Same day trying to smile; slight paresis of right VII (upper neurone). (*c*) 17th day; trying to smile; paresis of right VI and slight paresis of the right VII. (*d*) 38th day; expression normal; paresis of right VI. (*e*) 4 months after onset; normal.

followed by severe headache and delirium. On admission pale, sweating, delirious; T. 100·4° F.; pulse-rate 136; respirations 36; no pneumonia. Next day, sparse petechial eruption on trunk, neck rigidity, extensor plantar response, and noisy delirium with tendency to stupor but not coma. CSF purulent; meningococci group I. Blood-culture negative. Meningococcus antitoxin given, 60 c.cm. intravenously and 30 c.cm. intrathecally. By evening, condition grave; cyanosis; stuporous but could be roused; serum repeated. On Jan. 29 pulse-rate 144 and later uncountable; respirations 70; T. 105·6° F. Died on Jan. 30, on 4th day of disease, 34 hours after serum treatment was begun.

Autopsy.—Purulent meningitis with some softened areas in the brain, and purulent pericarditis. Two out of three sections of brain at different levels showed numerous capillary hæmorrhages with congestion and œdema but only slight capillary thrombosis; broad zones of perivascular polymorph cuffing with deposit of fibrin and hæmorrhage around many of the larger vessels deep in the brain tissue (fig. V). The smaller vessels showed no evidence of mononuclear infiltration. Section of adrenal showed some hæmorrhage following the course of a large thrombosed vessel, with numerous areas of necrosis in cortex and medulla, probably in the parts supplied by the thrombosed vessel. (In this case the cerebral lesions were more inflammatory than toxic and there was also bacterial invasion of the pericardium and possibly of the adrenal.)

Focal Encephalomyelitis

There is another quite different type of acute case characterised by a limited focal encephalomyelitis, together with purulent meningitis. Such cases at first resemble clinically the ordinary form of meningitis. They are always severe but lack the deep coma which is characteristic of widespread encephalitis, tending rather to stupor, semicoma and delirium, like many cases of the ordinary form of meningitis. In response to sulphonamide therapy, however, they do not clear up satisfactorily within two or three days. The clinical picture varies widely. The patients may be delirious and restless on several successive nights with rational intervals in the daytime, and then suddenly collapse and die even during a lucid interval (case 8). Young children may suddenly develop convulsions after a day or two and die in a few hours, in spite of the clearing up of the meningitis (case 9). These cases may even simulate

the widespread acute encephalomeningitic type if a subdural or extradural hæmorrhage produces acute intracranial pressure and coma (case 10). Post mortem, no satisfactory cause of death may be found in these cases on macroscopic examination, since the meningitis may have almost cleared up as a result of sulphonamide therapy. It is only on careful histological examination of various levels of the brain and cord that a few areas of focal encephalomyelitis consisting chiefly of small hæmorrhages are found, mostly in the region of the basal ganglia, midbrain, medulla and upper cord (figs. VI A and B). This limited lesion of brain and cord occupies an intermediate position between the widespread encephalomeningitis and the ordinary form of meningitis. In some cases it seems to be limited to small hæmorrhages; in others, capillary thrombosis is also seen. In pre-sulphonamide days, the small foci of suppuration occasionally found in the brain may have been a development of such lesions. When they have not proceeded to suppuration, the lesions are likely to be missed at autopsy unless a systematic histological examination of various levels of brain and cord is made.

MENINGITIS WITH FOCAL ENCEPHALOMYELITIS

CASE 8.—A boy of 18, admitted on Feb. 3, 1941, with 24 hours' history of illness. Neck rigidity, noisy delirium and drowsiness but not coma. CSF: 27,800 cells; meningococci group I. Given sulphathiazole 2 g., then 1·5 g. 4-hourly. In next 2 days improved greatly, but vomited three times and was noisy and restless each night, though rational by day. On Feb. 6 rational, able to lift head from pillow; suddenly at 2.30 P.M. became unconscious with dilated fixed pupils; pulseless; respirations 6 per min.; died in 5 min.

Autopsy.—Right heart failure, congested liver, enlarged thymus; meningeal exudate slight and only in the sulci and over vermis of cerebellum; brain and cord congested. Sections showed scattered focal hæmorrhages in cerebellum, basal ganglia, midbrain, and cervical and thoracic cord, especially numerous in cervical cord (fig. VI B). Also perivascular hæmorrhage in midbrain; no perivascular infiltration noted. Lower medulla not sectioned, but the extensive focal hæmorrhages in cervical cord suggested that it could hardly have escaped.

CASE 9.—A male child, aged 7 months, admitted April 25, 1941, 24 hours from onset of fretfulness, refusal of food, vomiting and diarrhœa. On admission, neck rigid; occasional vomiting; generalised petechial rash; fontanelle tense. CSF turbid, meningococci grew. Given sulphathiazole, 0·5 g., 4-hourly by mouth. Next day took feeds fairly well and vomited once. Suddenly collapsed 40 hours after admission; coffee-ground vomit; gentle clonic convulsions; dilated pupils and deep coma. Fundi showed congested veins. BP 98/40 mm. Hg. CSF: 2840 cells per c.mm. and scanty meningococci in films but not in culture; sulphathiazole content 6·3 mg. per 100 c.cm. Convulsions and coma continued till death 8 hours later.

Autopsy.—Scanty meningeal exudate in sulci, cerebellum, optic chiasma and lateral ventricles; brain and cord congested and very œdematous; extradural hæmorrhage in thoracic cord. Adrenals normal. Sections of cerebral cortex, cerebellum, medulla, thoracic and lumbar cord showed only congestion and œdema; in basal ganglia at region of internal capsule there was, in addition, capillary thrombosis, a few small capillary hæmorrhages, perivascular hæmorrhage and slight perivascular cuffing (fig. VI D). This focal encephalitis was taken to be the cause of death.

MENINGITIS WITH SLIGHT FOCAL ENCEPHALITIS AND LARGE SUBDURAL HÆMORRHAGE

CASE 10.—A boy of 19, admitted April 18, 1941, 30 hours after onset. On admission had been comatose 11 hours, but responded with groans to gross stimuli and swallowed with difficulty. Right pupil semidilated and did not react to light except through the consensual reflex; stertorous breathing; pulse full, rate 132; T. 99° F.; respirations 28; tongue dry; moderate neck rigidity; retention of urine; no rash. CSF purulent; pressure over 300 mm.; cells 40,000 per c.mm.; meningococci in films and culture. Given sulphathiazole intravenously and by mouth. Next day, right facial paresis; no papilloedema; BP 140/100 mm. Hg; slight glycosuria and acetonuria; breathing stertorous and irregular; pulse full. On April 20 still deep coma and stertor; swallowing reflex lost. CSF faintly salmon pink; cells 12,000; meningococci in films but not in culture. Fluids and drug given by stomach-tube, and 1000 c.cm. saline intravenously; in afternoon seemed to improve and spoke few indistinct words. On April 21 relapse into deep coma with profuse sweating; extensive herpes covered half of face. CSF still tinged faint pink; high pressure; cells 5300; meningococci in films but not in culture. Blood-urea 52 mg. per 100 c.cm.; blood-sugar 125 mg. per 100 c.cm. On April 22 coma absolute; swallowing and pupillary reflexes absent; stertor; sweating; pulse weak; generalised convulsions; T. 107° F.; death 5 days after onset.

Autopsy.—Subdural hæmorrhage 2 in. in diameter over left temporal region; very scanty purulent exudate on base of brain and in ventricles; brain and cord congested and œdematous. Sections of cortex, basal ganglia, midbrain, pons and medulla showed congestion and œdema, and in addition a hæmorrhage was seen in midbrain.

Marginal Encephalitis

Passing to the ordinary form of meningitis, we find examples with perivascular polymorphic infiltration around the larger vessels in the brain only in the neighbourhood of the meninges. When there is no evidence of encephalitis in any other part of the brain it is almost certain that these foci are the result of extension of exudate along vessel sheaths from the meninges. Meningococci are more easily demonstrated in these lesions than in those of true encephalitis. Clinically these cases are mostly severe examples of the ordinary form of meningitis with particularly heavy purulent meningeal exudate but marginal and true encephalitis may be present together (cases 3 and 4). Lastly, even in cases which are regarded as the ordinary form of meningitis itself it is not true to say that the brain is absolutely intact; careful search of brain sections occasionally reveals a few examples of slight capillary hæmorrhage and thrombosis.

SCHEME OF FULMINATING AND ACUTE FORMS.

FULMINATING	
Bacteriæmia or septicæmia	*Combined with one of the following:*
Purpuric rash	Adrenal lesions
Meningitis absent or beginning	Encephalitis *
	Adrenal lesions and encephalitis
ACUTE	
	Combined with one of the following:
Bacteriæmia or septicæmia	Widespread encephalitis *
Eruption present or absent	Widespread encephalitis * with adrenal lesions
Purulent meningitis	Focal encephalomyelitis
	Marginal encephalitis by extension from the meninges
	Ordinary form of meningitis

* Myelitis may also be present. The cord was not examined in the earlier autopsies.

Discussion

The case-histories recorded here are, with one exception, taken from the epidemics of 1940–41. Meningococcal encephalitis may however appear in non-epidemic years at the period of highest prevalence. On looking through our records for 1937–39, we found at least 7 cases out of approximately 150 in which encephalitis may have been present. All these cases occurred in the period from January to May of each year, and most of them in March when the virulence and massive dosage of the organisms were highest. In most cases autopsies were performed without encephalitis being suspected. From only one of them (case 7, the case not treated with sulphonamides) are brain sections still available. These show the gross brain lesions mentioned in the case-record and which we take to be mainly inflammatory rather than toxic. This reaction may be due partly to lower virulence of the meningococcus in 1937 and partly to the absence of sulphonamide action.

These 10 cases and others in our experience suggest the following as factors in the pathogenesis of the disease. The meningococcus invades meningeal or cerebral vessels and thence reaches the subarachnoid space. In the ordinary form of meningitis there is little or no recognisable brain lesion, beyond an occasional odd example of capillary thrombosis. When the organisms are highly virulent and the dose massive, as when an epidemic is nearing its height, cases are found in which

the invasion of the brain and cord is of much greater intensity and range. The following three main degrees of this invasion can be recognised as distinct clinico-pathological syndromes.

The first, the most intense, and probably the most rare, is a fulminating encephalitis, without or with meningitis. Clinically this form is characterised by a profuse purpuric rash with rapid onset of coma and by death within 24 hours. Pathologically there is intense congestion and œdema, small hæmorrhages and capillary thrombosis widespread in the central nervous axis, but little evidence of polymorph infiltration. The process is apparently too rapid for much multiplication of organisms within the body, and is more consistent with a toxic effect produced by massive doses of highly virulent organisms. Varying degrees of the acuteness of the process can be recognised. In the most rapid cases there is no time for meningitis to develop before death. In others there is commencing meningitis, and occasionally there may also be invasion of the suprarenals accompanied by massive hæmorrhage. (In addition to the fulminating encephalitic cases there is a quite different fulminating form of the infection which picks out the suprarenals only, leaving the brain and cord intact except sometimes for meningitis. The outstanding clinical sign here is hypotension, and cerebral signs are relatively slight or absent. Mixtures of these two fulminating types also occur.)

The second main cerebral syndrome, slightly less intense than the fulminating, is an acute encephalomeningitis. Clinically it is characterised by signs of acute meningitis which rapidly become complicated by encephalitic signs, especially sustained deep coma, cyanosis, and rapid or stertorous and irregular breathing. These cases usually end fatally within a few days without regaining consciousness, but recovery with transient parkinsonian symptoms is demonstrated in this paper. Pathologically the lesion in the central nervous axis is dual. There is, first, congestion and œdema with capillary thrombosis and hæmorrhages scattered regionally, probably a toxic effect. Secondly there is an inflammatory reaction, shown by perivascular polymorph cuffing and hæmorrhage, sometimes with fibrin deposition and even commencing abscess formation. Under sulphonamide treatment both the meningitis and the cerebral inflammatory reaction usually show signs of clearing up, but the toxic damage is relatively unaffected and is probably the principal factor in the fatal result.

The third main syndrome shows cerebral invasion to a much smaller extent, and may be seen not only at the most virulent phase of an epidemic but at other stages also. It may be described as meningitis with focal encephalomyelitis. The clinical picture in this type is diverse, including protracted and recurrent delirium with sudden fatal collapse, or sudden convulsions with secondary coma and death, or even deep coma resulting from large subdural hæmorrhage. Pathologically, the lesion consists of purulent meningitis, with a limited number of small hæmorrhages and sometimes thromboses and slight perivascular infiltration, usually about the basal ganglia, midbrain, medulla or upper cord.

Summary

Meningococcal infection of the central nervous system is not limited to meningitis; careful histological examination of the brain and cord occasionally provides evidence of wide spread (regional) or focal encephalomyelitis.

In epidemics a rare form of fulminating meningococcal encephalitis with a characteristic clinical picture and pathological pattern may occur. This is quite different from the fulminating cases associated with an adrenal lesion, although mixtures of the two forms are occasionally seen.

Another distinctive clinico-pathological cerebral syndrome, also seen chiefly in epidemics, is acute encephalomeningitis. It is usually fatal in a few days, but recovery with transient parkinsonism is known.

A third and more limited type of meningococcal invasion of the central nervous axis is described as meningitis with focal encephalomyelitis. It may sometimes be associated with unexpected fatal collapse or convulsions.

We report 10 cases: 3 of fulminating encephalitis, 4 of acute encephalomeningitis and 3 of meningitis with focal encephalomyelitis.

We have to thank Dr. A. B. Bratton and his staff of the Central Histological Laboratory for performing autopsies and preparing sections; Dr. E. M. Young of the Southern Group Laboratory for other post-mortem work; Dr. L. J. M. Laurent and Dr. E. Montuschi for help in the clinical work; Messrs. Ciba Ltd. for providing regular supplies of sulphathiazole ('Cibazol'); and Messrs. May and Baker Ltd. for supplying Thiazamide. The microphotographs were produced at the Southern Group Laboratory, Park Hospital. This work is published with the permission of the Medical Officer of Health, London County Council, but we are solely responsible for the views expressed.

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INTESTINAL FLATULENCE WITHOUT EXCESSIVE FERMENTATION

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(*Illustrations on plate*)

INTESTINAL carbohydrate dyspepsia, about which Knott and I published a paper in 1931, accounts for approximately half the cases in which excessive gas accumulates in the intestine and excess of flatus is passed; it can be relieved by restricting carbohydrate intake. In the remaining cases gaseous distension of the intestines occurs without any excessive fermentation as a result of interference with the normal absorption of gas by the veins of the bowel. This is the cause of the intestinal flatulence of portal obstruction and of chronic cardiac and pulmonary disorders. It is often the first symptom of cirrhosis of the liver, "*le vent avant la pluie*," and of heart failure. It may also be caused by local venous obstruction in chronic partial volvulus of the cæcum or pelvic colon, a not uncommon condition, which only occasionally ends in acute volvulus with extreme gaseous distension due to complete venous obstruction. The distension of the bowels in this second group of conditions is quite unaffected by restricting the starch of the diet. It is made worse by aperients and is either incompletely relieved or actually aggravated by enemas. In most cases the patient gains immediate relief by passing flatus, the condition causing little discomfort but much inconvenience owing to the frequency with which flatus has to be passed during both day and night. In some cases, however, relief is only partial, and considerable discomfort ensues from the abnormal tension on the walls of the intestine caused by the presence of excess of gas. The distended colon may press upon and dislocate the stomach, producing either obstruction at the cardia with consequent *aërogastrie bloqué* (Ramond 1920, 1933, Hurst 1938), in which gas is locked in the stomach and cannot be evacuated by belching, or pyloric obstruction.

The well-known effect of the pressor substance of the posterior lobe of the pituitary in postoperative ileus, and in the preparation of patients for cholecystography (first proposed by Collins and Root 1936), suggests that it might be useful for the intestinal flatulence in these conditions. Most patients with diabetes insipidus are familiar with the fact that the pressor substance causes immediate and complete defæcation, and colic associated with overaction of the bowels may be a serious drawback in their treatment. With intestinal flatulence I have found that on using 'Pitressin' (PDCo)* both fæces and gas

* A solution of pressor substance of the posterior lobe of the pituitary without the principle that acts on the uterus.

are evacuated by a single mass peristaltic contraction of the colon without the slightest discomfort, provided that care is taken to adjust the dose to the minimal requisite units (20 units = 1 c.cm.). The fæces differ from those evacuated by a purgative in consisting of the normal colonic contents without the excess of water and incompletely digested food produced by over-rapid passage through the small intestine, and without the mucus produced by irritation of the intestinal mucous membrane. The daily use of pitressin does not appear to lead to any ill effects, and it is sometimes possible to reduce the dose gradually till no more is required. When pressure by the greatly distended colon has resulted in *aërogastrie bloqué* or pyloric obstruction, these secondary effects are also overcome by the use of pitressin, as in the following case.

CASE-RECORD

A woman of 54 was admitted to the Acland Home on Jan. 29, 1941, for indigestion of 10 years' duration. She experienced a sensation of fullness in the epigastrium after meals which sometimes amounted to pain. It often caused vomiting, which gave immediate relief. She found it necessary to restrict her intake of food and she consequently steadily lost weight. The symptoms were always aggravated by worry. In October, 1939, she had had violent pain and vomiting, and acute intestinal obstruction was diagnosed. The cæcum was found to be enormously distended and a cæcostomy was performed, but two months later abdominal exploration, on closing the stoma, revealed no cause of obstruction except an acute kink just beyond the hepatic flexure. The patient was better for a time, but in September, 1940, there was recurrence of epigastric pain and vomiting with rapid loss of weight. By eating very little she could keep comparatively comfortable, but a normal intake of food at once led to severe discomfort, disturbed nights and vomiting. Between September, 1940, and her admission in January, 1941, she lost a stone and a half in weight. She was much troubled with constipation, for which she habitually took aperients, and passed a great deal of flatus which gave little relief. When X rayed in January, 1941, just before admission, severe gastric stasis was discovered, a considerable residue being still present at 24 hours. This was thought to be caused by a stricture of the duodenum from old ulceration. Since there was no history suggesting duodenal ulceration, and since both the original radiograms and others taken in Oxford by Dr. D. T. Barnes showed an enormous accumulation of gas in the cæcum and ascending colon (fig. I), I thought it possible that the duodenal obstruction was caused by external pressure by the dilated intestine, and not by cicatricial stenosis (fig. II). Her bowels were opened with aperients and enemas, but they both increased the discomfort and did not reduce the gaseous distension. Examination of the stools showed no deficiency in the digestion of starch and no gas was produced on incubation.

It was then decided to try the effect of subcutaneous injections of pitressin. The patient's bowels were opened within 5 min. of the first injection of 20 units (1 c.cm.), and a large quantity of wind was evacuated without the slightest discomfort. The gastric stasis and associated feeling of epigastric discomfort disappeared. The X rays showed that the injection must have been followed by mass peristalsis which almost completely evacuated the fæces and gas from the colon (fig. III). The patient continued to inject 18 units (0·9 c.cm.) of pitressin every morning without any aperients, and with this treatment her bowels were regularly opened, and the gastric discomfort and cæcal distension completely disappeared. She reported at the end of December that she was now taking 8 units (0·4 c.cm.) of pitressin every morning and was comfortable in every way. She was on a full diet and lived an active life.

I am inclined to think that she must originally have had a partial volvulus of the cæcum and ascending colon, and that the circulation of this part of the colon was permanently impaired, so that the gas normally produced by bacterial activity in the proximal part of the colon could not be absorbed.

SUMMARY

Excess of gas may accumulate in the colon as a result of either excessive production by fermentation or of deficient absorption. The former alone is relieved by restriction of starch.

Colonic distension may dislocate the stomach, producing obstruction of the cardia (*aërogastrie bloqué*) or pylorus.

Complete and painless evacuation of fæces and gas can be obtained by subcutaneous injection of pitressin.

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HISTOPLASMOSIS OF DARLING

REPORT OF A CASE

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(*Illustrations on plate*)

IN 1905 S. T. Darling was one of the pathologists in the Panama Canal Zone. He had been interested in the discovery of the organism of kala-azar made two years before by Leishman and Donovan, and he set about examining microscopically the spleens of all those dying with a splenomegaly, in an attempt to identify this organism. He failed to find cases of visceral leishmaniasis, but noted 3 cases containing similar bodies which he regarded as examples of a generalised protozoan infection. This organism he named the *Histoplasma capsulatum* (Darling 1906). In 1913 Rocha-Lima pointed out the similarities between *Cryptococcus farcinimosus*—the fungus responsible for epizoötic lymphangitis—and *H. capsulatum* and considered that the latter organism showed more affinities for the blastomyces than for the protozoa.

A few cases of histoplasmosis were reported from time to time, but it was not until 1934 that De Monbreun first cultivated the parasite and determined its cultural characteristics. This stimulated a search for other cases and in the latest review on the subject Meleney (1940) noted 19 cases and described 13 more then unpublished. Not all of these were examples of proved infection by the fungus. Our case of histoplasmosis is apparently the first to be noted in this country; indeed, no case seems yet to have been recorded outside the American continent.

CASE-RECORD

A soldier, aged 30, was admitted to an E.M.S. hospital on April 8, 1940, from a base hospital in France, complaining of cough and sore throat which he had had for three months. He served as a regular soldier from 1932 to 1936 in India, and in the Sudan from 1936 to 1937. He had a slight attack of malaria in India but no dysentery, and could not recollect ever having any special contact with horses, mules or dogs. He had no regular employment after his discharge from the Army, but worked as a general labourer, part of the time in a stone quarry, before returning to the Army in August, 1939. He had had no serious illnesses, and except for some winter cough had remained fit until December, 1939.

LEGENDS TO ILLUSTRATIONS

DR. BANKS AND DR. MCCARTNEY

FIG. I—Fulminating encephalitis. Case 1. (A) Capillary thrombosis. (× 250.) (B) Capillary hæmorrhage. (× 300.)

FIG. II—Fulminating encephalitis and adrenal hæmorrhage. Case 3. Capillary thrombosis with gross œdema. (× 590.)

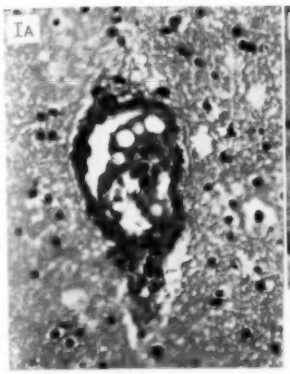
FIG. III—Acute widespread encephalomeningitis, rapid type. Case 4. (A) Perivascular mononuclear infiltration. (× 580.) (B) Capillary thrombosis including one at a junction. (× 190.)

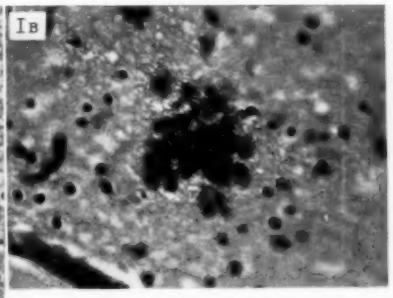
FIG. IV—Acute widespread encephalomeningitis, slower type. Case 5. (A) Multiple capillary hæmorrhages; polymorph perivascular cuffing at the top. (× 35.) (B) Capillary hæmorrhages with thrombosed capillary in centre. (× 140.) (C) Capillary thrombosis with perivascular cuffing. (× 295.) (D) Congestion, capillary thrombosis, polymorph and mononuclear cuffing. (× 250.)

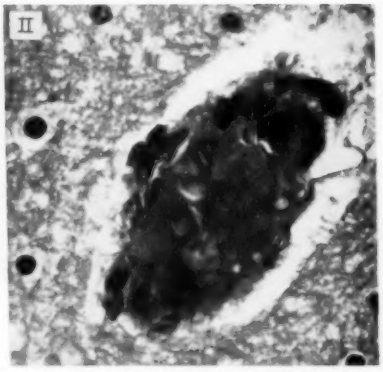
FIG. V—Acute widespread encephalomeningitis not treated with sulphonamides. Case 7. Congestion, capillary thrombosis, fibrinous and polymorph cuffing; commencing abscess. (× 190.)

FIG. VI—Meningitis with focal encephalomyelitis. (A) Case 8. Capillary hæmorrhages in upper cervical cord. (× 80.) (B) Case 9. Capillary hæmorrhages under ependyma. (× 115.)

DR. BANKS, DR. McCARTNEY: MENINGOCOCCAL ENCEPHALITIS







FIGURES ILLUSTRATING CASE-RECORDS
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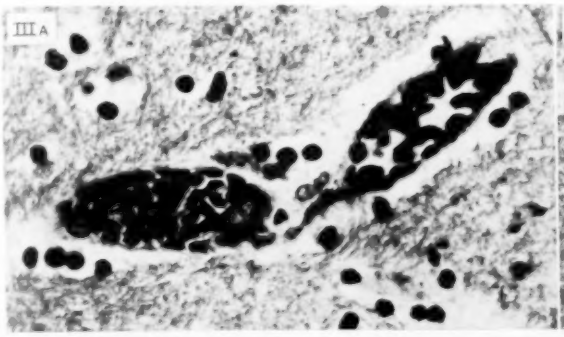
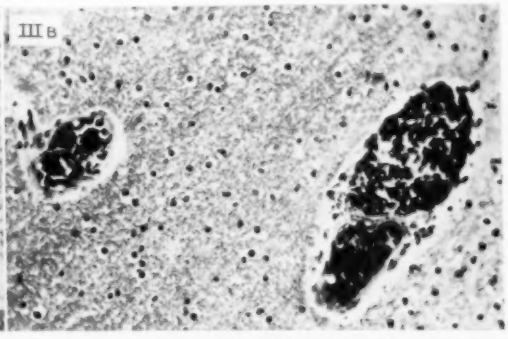
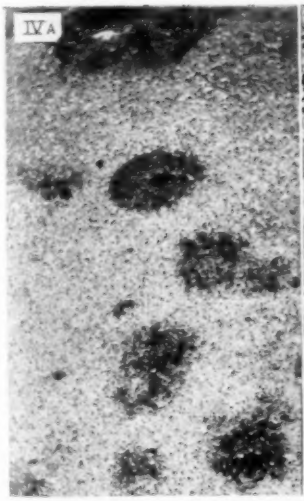
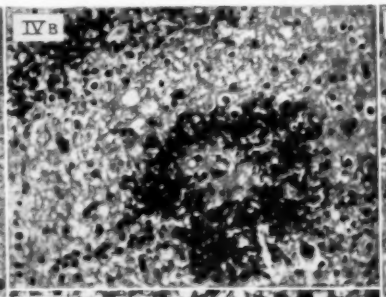
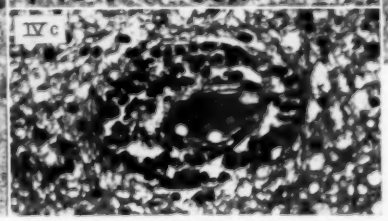
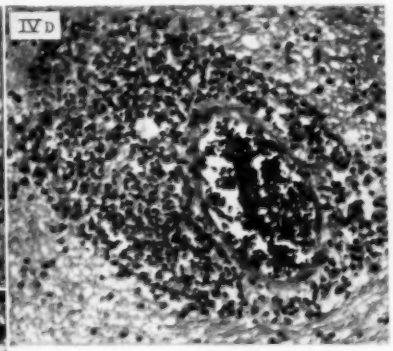


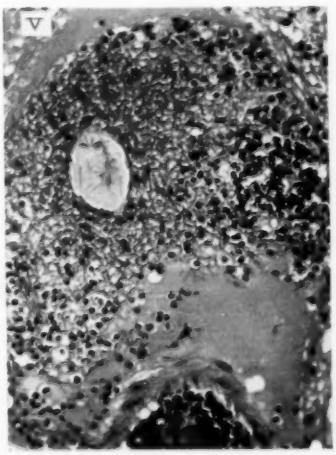


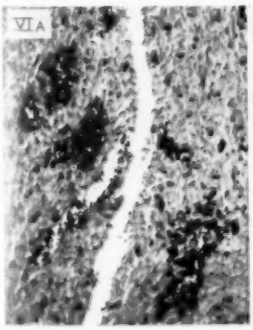


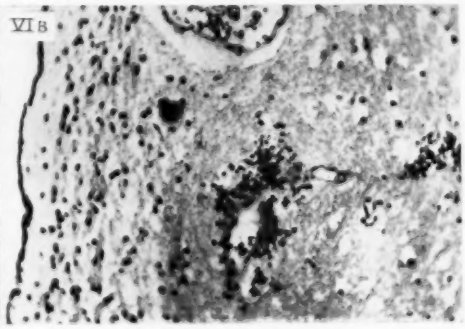






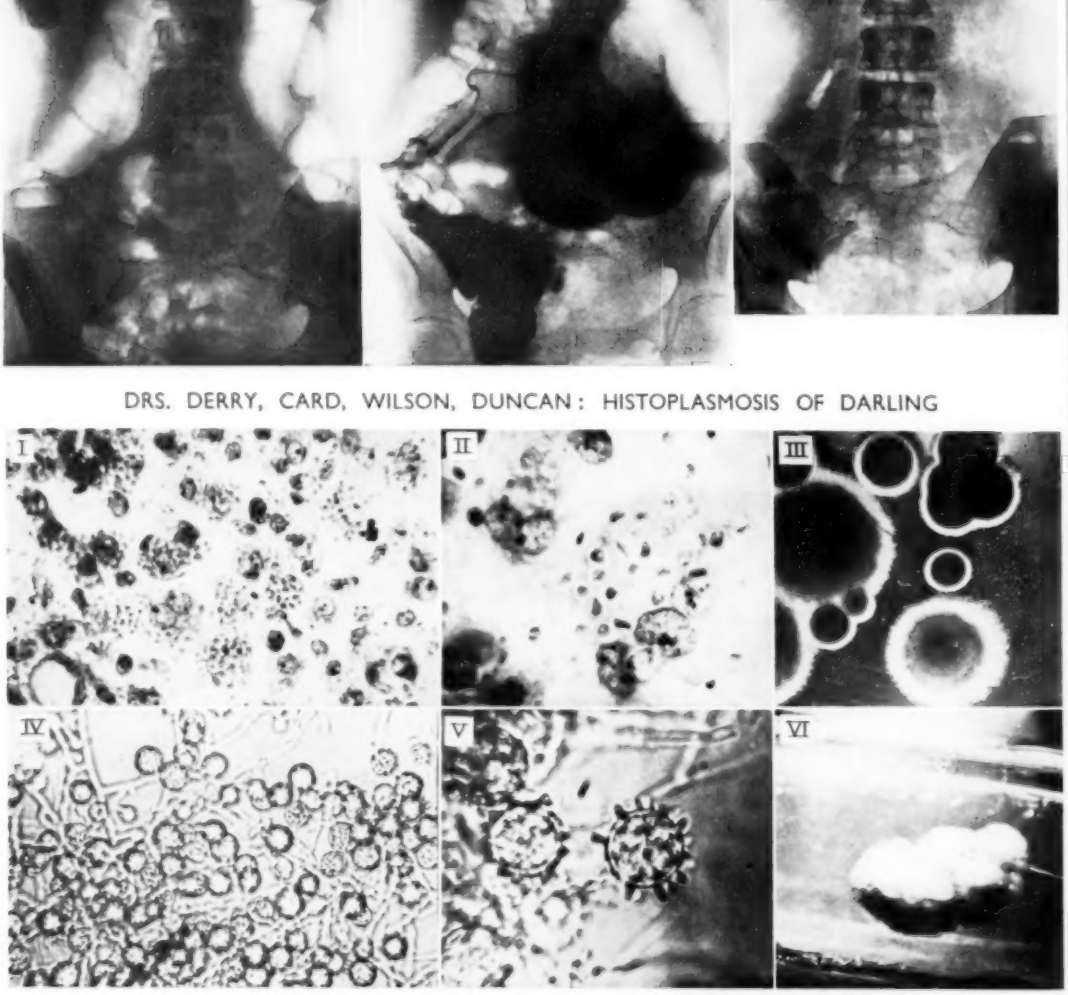




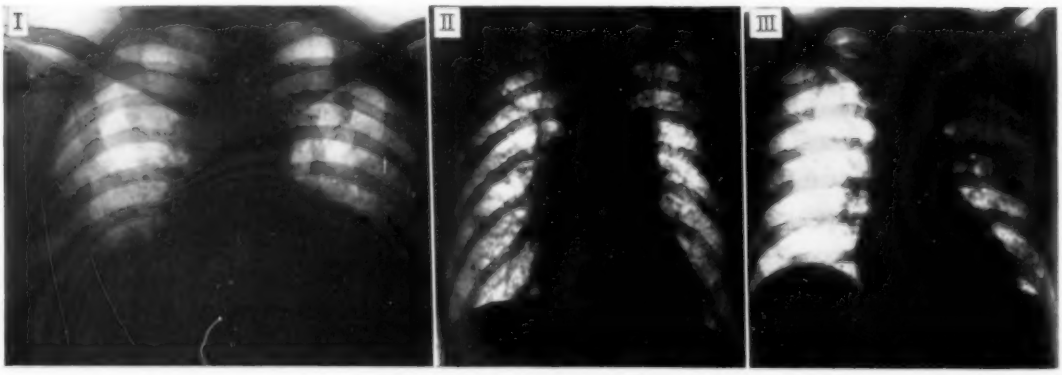


SIR ARTHUR HURST: INTESTINAL FLATULENCE

DRS. DERRY, CARD, WILSON, DUNCAN: HISTOPLASMOSIS OF DARLING



MR. SCOTT, DR. KEMP, DR. ROBB-SMITH: PULMONARY FAT-EMBOLISM



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During that month, while in France, he developed a severe cough and 2 months later a swelling in the preauricular region. The swelling was painless and disappeared after 5 days of conservative treatment; the cough also disappeared and feeling fit he came home on leave on Jan. 12, 1940. After 3 days he developed a cough and left-sided pleurisy, and was kept in bed for 2 weeks. He then returned to France though the cough had not gone. During the next few weeks he reported sick periodically with shortness of breath on exertion. On March 18, 5 weeks after his return to France, he developed another swelling, this time under his chin, and was admitted to a base hospital with a tentative diagnosis of pulmonary tuberculosis. He had a remittent temperature and a submental abscess which was incised, streptococci being grown from the pus; 9 days later a direct smear from the submental abscess showed many pus cells; no tubercle bacilli were seen and culture was sterile. The spleen was palpable. A blood-count was normal; his temperature rose to 100°–101° F. and his pulse-rate was 80–100. While in the base hospital his general condition deteriorated, and he was therefore sent home to England.

When admitted to the E.M.S. hospital he was pale and wasted. No enlarged lymph-nodes were felt. There were no abnormal physical signs in his chest. Clinically his heart was normal; blood-pressure 140/75 mm. Hg. His spleen and liver were not definitely palpable. He had an irregular pyrexia with a corresponding tachycardia. Sputum was exhaustively examined for tubercle bacilli with negative results. Blood-count on April 15: red cells 4,400,000; Hb 62%; colour-index 0·7; white cells 13,000 (polymorphs 78%, lymphocytes 13%, large hyalines 9%). Routine serum agglutinations were negative. An X ray of his abdomen showed some enlargement of his liver and left kidney. All other clinical, laboratory and radiological investigations were negative. He was treated with iron and nursed in the open air, no diagnosis having been made. A course of sulphapyridine was started on May 9 and for 3 days his temperature remained normal; it then rose to 101° F. and the drug was discontinued 3 days later. By this time his spleen and liver were palpable and remained so. Clinically he appeared to be much improved and except for a slight cough and some sweating was free from symptoms. Blood-count on May 6: red cells 4,360,000; Hb 85%; colour-index 0·9; white cells 6600 (polymorphs 81%, lymphocytes 15%, large hyalines 3%, eosinophils 1%). Blood-culture on May 15 negative after 10 days; no parasites seen in blood films; blood Wassermann and Kahn reactions negative. Microscopical examination of his urine showed only occasional red cells and an intravenous pyelogram was within normal limits. On the chance that this was an atypical case of malaria, a course of quinine, gr. 10 t.d.s., was given for 5 days without effect. The possibility of kala-azar had been entertained for some time, and on June 6 a sternal puncture was done. Examination of the marrow showed a differential count within normal limits and no intracellular organisms. The formol-gel test of Napier was negative on 3 occasions.

At about this time the patient complained of pain in the left upper abdomen and was drowsy. His condition, which up to now had remained stationary, began to deteriorate. Diagnoses considered were lymphadenoma, lymphosarcoma and aleukæmic leukæmia. His liver and spleen were still enlarged and tender, but no connexion between this enlargement and the original swelling of the preauricular and submandibular glands had been established. On admission, no swelling was visible in these regions, but 3 weeks later, on April 29, a tender mobile preauricular swelling developed beneath the scar of the old incision. This subsided, but was again noted on June 4 and a few days later broke down and discharged. The discharge was sterile on culture and no tubercle bacilli were seen, but unfortunately no cytological examination was made. On July 14 a biopsy was done on a granulomatous mass which had formed on the site of the old incision in the submental region. Microscopy showed numerous endothelial cells with inclusion bodies which were recognised as yeasts, and on Aug. 3 a glandular swelling appeared in the upper part of the left femoral triangle. A biopsy was performed on this swelling, which on incision had the appearance of a cold abscess with some greenish pus and a necrotic centre. The tissue removed had microscopical appearances similar to that obtained from the submental region. This finding established the presence of a systemic mycosis. The stools were examined for yeasts but none was seen.

On the supposition that the case might be kala-azar, a course of intravenous antimony had been started on July 6. Injections of 'Neostam' (BWCo) were given on alternate days, a total of 1·15 g. being given. The drug was stopped owing to the discovery of the fungus, and large doses of potassium iodide, up to gr. 240 daily, were given. The patient had developed œdema around the ankles and over the sacrum on June 24, and a month later ascites and meteorism appeared. These caused considerable abdominal distension and much distress until his death. On July 30 a specimen of urine showed a few hyaline and granular casts. Liver function on Aug. 7 was 92% of normal as estimated by the hippuric acid excretion test. An X ray of chest on July 27 showed slight basal congestion with a high right diaphragm. By that time the patient had become very emaciated; the sinuses on the face, chin and thigh had failed to heal and exuded serous fluid. A last blood-count showed: white cells 18,000 (polymorphs 84%, lymphocytes, 12%, large hyalines 4%); no evidence of monocytic phagocytosis. The patient died on Aug. 23.

AUTOPSY

The body was that of an emaciated man with right submental and preauricular sinuses and a distended abdomen. Tonsils and post-lingual lymphoid tissue hyperplastic, showing areas of necrosis on section; anterior and posterior cervical glands on both sides firm and whitish and greatly enlarged; several showed central necrosis. Bronchial and mediastinal glands not enlarged. Mesenteric nodes enlarged and whitish. Old adhesions of right lung; all lobes showed gross œdema and Tardieu's spots. Terminal bronchopneumonia. Heart small; increased pericardial fluid with gelatinous œdema of pericardial fat. Cultures taken from heart's blood. Much ascites. Liver adherent to diaphragm, stomach, spleen and both kidney areas. Large retroperitoneal mass behind liver, involving lesser sac, and extending from pole of one kidney to pole of other. Adrenals could not be identified; main portion of the mass was over left adrenal area. On cutting into mass a large quantity of pultaceous material escaped; cavity had rough shaggy lining. Cultures were taken. Small intestine showed several intramural subperitoneal foci, similar in appearance to main mass. Two large old calcified tuberculous glands present in cæcal region. Spleen weighed 17 oz. Capsule thickened; on section several whitish areas present, some immediately under capsule; one had ruptured, releasing necrotic material into peritoneal cavity. Pelvis full of purulent lymph. Primary site of suppuration appeared to be in retroperitoneal lymphatic tissues of upper abdominal wall, which had broken down in one place, discharging pus

LEGENDS TO ILLUSTRATIONS

SIR ARTHUR HURST

FIG. I—Large accumulation of gas in colon.

FIG. II—Radiogram taken 7 hours after opaque meal, showing gastric stasis caused by dislocation of stomach by distended colon.

FIG. III—Disappearance of gas from colon 5 min. after injection of 0·5 c.cm. pitressin.

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FIG. I—Tissue from lymph-gland in groin, showing large endothelial cells filled with yeast bodies. (×120.)

FIG. II—Large endothelial cell with three nuclei and filled with yeast bodies. (×1200.)

FIG. III—Fourteen-day culture of the mycelial or saprophytic form, showing aerial hyphæ.

FIG. IV—Chlamydospores and hyphæ. (×500.)

FIG. V—Chlamydospores, echinate form. (×1200.)

FIG. VI—Pathogenic or yeast form after three weeks growth at 37° C. on blood agar.

MR. SCOTT, DR. KEMP, DR. ROBB-SMITH

FIG. I—Radiogram of case 1, taken 5 days after the onset of symptoms, showing the signs of pulmonary œdema.

FIG. II—Radiogram of case 3, the day after the accident, showing signs of previous pulmonary disease but no evidence of pulmonary consolidation.

FIG. III—Radiogram of case 4, a few hours after the accident, showing patchy consolidation of the left lung and a clear right lung field.

into pelvis; apart from this spread was confined to reticulo-endothelial system. Bone-marrow of shaft of femur red; films showed no yeasts.

Sections (stained hæmatoxylin and eosin, other stains gave no additional information).—Spleen: localised necrotic areas consisting of a surround of large endothelial cells, with many spores in their cytoplasm, merging into a necrotic centre where cells of tissue showed as "ghost" forms. No yeasts present in necrotic areas. Between these areas was a band of pyknotic cells and cell debris. Remaining splenic tissue congested and fibrotic with scattered eosinophil and plasma cells; little normal pulp remained. No purulent areas. Bone-marrow: some normocytic myeloid hyperplasia; no yeasts present. Liver: acute passive venous congestion, with foci of small round cells in Glisson's capsule; no yeasts present; where liver tissue was in contact with abscess mass there was erosion of capsule by granulation tissue of the type already described. Kidneys: patchy interstitial fibrosis, with œdema and cloudy swelling and areas of small round-cell infiltration; early fibrosis of glomeruli; thickened capsule; no yeasts in parenchyma; capsule eroded where in contact with main abscess mass. Lungs: usual picture of bronchopneumonia; no yeasts present. Tonsils, cervical lymph-glands and subperitoneal foci in the small bowel all showed typical yeast-bearing granulations with necrotic centres. Large bowel and pelvic colon showed several similar foci of granulation tissue.

PATHOLOGY

Culture of pus from the submental sinus on June 12 showed a few colonies of *Staphylococcus albus* and *aureus*. On July 14, section of tissue from the wall of the submental sinus allowed a provisional diagnosis of mycotic infection to be made. The granulation tissue showed considerable endothelial-cell hyperplasia, with areas in which the endothelial cells formed giant cells, having two and sometimes three nuclei and cytoplasm packed with small yeastlike bodies about 1·5–2μ in diameter. Some of these bodies appeared to have capsules and measured 2–3μ in diameter; these stained well with ordinary hæmatoxylin and eosin. Several areas showed necrosis; no purulent reaction was present. Leishman-Donovan bodies were excluded by the lack of the typical nucleus and rod-shaped kinetoplast (figs. I and II).

On July 14 another specimen of pus from the same sinus was found to contain masses of typical oatshaped yeast bodies, about 10–12μ in diameter. In stained films these showed thick capsules containing peripheral crescentic nuclei; at the time it was thought they might be a secondary infection of the sinus. On ordinary media colonies of *Staph. aureus* and *albus* were grown.

On Aug. 5 an enlarged lymph-node removed from Scarpa's triangle was found, both in smears and on section, to be histologically identical with the former specimen from the submental region; the large endothelial cells loaded with yeasts were again the most arresting part of the picture. It was then realised that we must be dealing with a form of systemic yeast infection, since there had been no breaking down of the skin over the site of the gland. In view of this, on Aug. 13 another swab from the original sinus was plated on Allison-Ayling tellurite medium, and incubated at room temperature and at 37° C., both anaerobically and aerobically. Those plates incubated anaerobically showed no growth; those incubated aerobically at 37° C. grew a diphtheroid bacillus, but those grown at room temperature showed on the fourth day thin dry greyish gossamer-like colonies consisting of a fine branching mycelium; by placing the plate under the low power this mycelium was seen to emanate from the individual yeast bodies.

On Aug. 15 the patient's blood was examined for yeasts, but no monocytic phagocytosis—as described by Dodd and Tomkins (1934) in their case of histoplasmosis—was demonstrable. Blood-culture was not tried. On the same date a second attempt was made to isolate the yeast from the sinus discharge, the material being sown on human blood agar, beerwort agar, Sabouraud's medium, 10% dextrose agar, and malachite-green medium; all these cultures were heavily overgrown with diphtheroids.

On Aug. 20 subcultures were made from the original tellurite agar plate on to Sabouraud's medium, rabbit's blood agar, beerwort agar, and a second tellurite plate. All were put up at 37° C. and at room temperature aerobically. At 37° C. nothing grew, but at room temperature a good growth of the fungus was obtained on all media.

On Aug. 23 the patient died, and an autopsy was performed an hour after death with the object of getting live cultures and the freshest material possible for sections. Cultures from the heart's blood plated on rabbit's blood agar and incubated at room temperature and at 37° C. grew only *Bacterium coli*. Of the cultures from the main mass incubated at room temperature, *Bact. coli*, *Staph. albus* and a fungus similar in all respects to that grown during life were isolated. The tellurite agar plate, inoculated with the same material, gave a pure culture of this fungus, which had similar morphology and cultural characteristics to the fungus obtained during life. In none of these cultures was the original yeast form obtained. The original cultures underwent various changes with age, the colonies gradually became ochre in colour with a dark brown centre, and about the 14th day aerial hyphæ became apparent to the naked eye as whitish tufts. These bore chlamydospores on short stalks, and many showed terminal or intercalary chlamydospores. The colony grew down into the agar almost as far as the aerial portion rose above it, and similar chlamydospores were formed in the submerged portion. No yeast-like bodies could be seen. The culture smelt like rotten wood. The chlamydospores, about 16–25μ in diameter, consisted of a capsule varying in thickness and containing many small round bodies which stained fat-positive with Sharlach R. The submerged chlamydospores appeared to have a thicker capsule. Many of the aerial chlamydospores were studded with short thick protoplasmic processes varying in length from 1 to 6μ (echinate forms). The organism grew quite well on subculture on the ordinary laboratory media. The young mycelium was straight branched and segmented, with thin walls filled with granular cytoplasm and a few fat globules, the granules being in brownian movement. As the culture aged the mycelium became greater in diameter, and the walls thicker. The young mycelium was about 2–5μ in diameter. When De Monbreun's method of drying the mycelium was used and the chlamydospores plated, they were never induced to sprout new mycelium; and although repeated efforts were made to induce a change to the yeast form by this method no success was obtained. Later, a good growth of the yeast form was obtained several times by heavy inoculation on blood agar at 37° C. (figs. III–VI).

DISCUSSION

The symptoms and signs in the reported cases of histoplasmosis are variable. Anæmia, wasting, long-continued fever and sweating are the only constant features; splenomegaly, enlargement of lymph-glands, and pulmonary symptoms are relatively common. It is impossible to make a diagnosis from the clinical manifestations alone and histological and cultural methods must be employed. Very few of the cases in the literature were diagnosed during life.

Nothing in the history of our case suggested a probable source of the infection. With the exception of this case and one of doubtful authenticity in Java, the small number of recorded instances of human histoplasmosis have occurred in widely separated places in Central and North America. There is no known occupational factor and the age of the affected persons ranges from 6 months—in a case reported by Dodd and Tompkins (1934)—to adult life. The duration of the disease to the time of death is usually months, but the infant described by Dodd and Tompkins died in less than 8 weeks.

Treatment in all of the definitely proved cases recorded has been ineffective. Meleney (1940) suggests that the localisation of the organism in the reticulo-endothelial system may be evidence of its susceptibility to antimony and that this should be given. Neostam was tried in our case but the dose was not pushed to an effective level.

The large increase in the number of cases reported recently from America suggests that this type of infection has been overlooked in the past. It seems possible that cases of histoplasmosis have similarly escaped recognition in this country.

Mycological Note

DR. J. T. DUNCAN

EMERGENCY PUBLIC HEALTH LABORATORY SERVICE AND LONDON SCHOOL OF HYGIENE

On Aug. 12, 1940, I received two paraffin sections of a lymphatic gland excised from the patient's neck. These, when stained by Giemsa's stain and by the Claudius modification of Gram's method, showed the characteristic picture of histoplasmosis. No fresh material was available to me for cultivation of the causal fungus, but shortly afterwards Dr. Derry succeeded in cultivating it from

materials taken both before and after death. I received a transplant of this fungus and found it to agree in all essential morphological characters with *H. capsulatum* Darling as described by De Monbreun (1934).

This fungus is a parasite of the reticulo-endothelial system, the cells of which are stimulated to local hyperplasia by the distribution of the parasite in the body, with associated non-inflammatory focal necroses in the organs and tissues infiltrated. The resulting symptoms, depending on the organs chiefly affected, vary and the disease may simulate kala-azar, tuberculosis, and certain mycotic infections. For this reason the diagnosis, as with other mycotic granulomata, must eventually depend on identification of the causal fungus, which should present little difficulty if the disease is suspected. The fungus should be identified both in preparations from the lesions and in culture.

In the lesion.—For microscopic examination of the infected tissues, fragments should be obtained if possible by biopsy from an involved superficial lymphatic gland or skin lesion, or by sternal trephining; or, perhaps, by spleen or liver puncture when these organs are affected. A thick blood-smear technique may also be tried, and the pus-like material from breaking-down granulomata and sputum from pulmonary cases should be examined. Slide-smears should be made and if fragments of tissue are available these should be embedded in paraffin and sectioned. In smears and sections stained by Giemsa's or similar stains, or by hæmatoxylin and eosin, the parasitic form of the fungus is seen as an oval or apiculate yeast, present in large numbers within the endothelial cells or lying free. Its average measurements, depending on the method of preparation, are about 3·5μ by 2·5–3μ and it possesses a thick, well-defined, achromatic capsular structure; its cytoplasm presents the characteristic vacuoles of the yeasts and its nucleus is ill-defined or not stained. In contrast with this, the Leishman-Donovan body, the parasite of kala-azar for which *H. capsulatum* may be mistaken, presents a strongly staining nucleus and blepharoplast and is, of course, a protozoon. Confirmatory evidence of the nature of the parasite may be got by staining the preparation by the Claudius modification of Gram's method which colours *H. capsulatum* solidly a deep violet against the yellow background of the containing cell. The appearance of large numbers of these small capsulated yeasts filling the cells of the reticulo-endothelial granuloma is characteristic of histoplasmosis.

In culture.—Although the diagnosis of histoplasmosis can be made by microscopic examination of the tissues alone, the specific identification of the causal fungus requires its study in artificial culture. The fungus grows freely and survives for long periods on a variety of common culture media, yet the history of histoplasmosis records repeated failure to cultivate the causative fungus until De Monbreun succeeded in 1932. Failure in attempts at primary culture may be due to concomitant or contaminating bacteria which, growing rapidly, prevent the development of the fungus, to the use of unsuitable inocula in which the fungus elements are no longer viable, to insufficiently heavy sowing, to failing to incubate some of the cultures at a temperature below body heat, or to not allowing time for the slow initial growth.

The material for cultivation—ground-up tissue or pus-like material—must be sown thickly on the medium, not only to introduce a sufficient number of viable fungus elements but to provide some of the animal tissue in which the fungus has been living; for it seems probable that adaptation of the parasitic fungus to saprophytic life is aided by the presence of such material, and that the earliest saprophytic growth develops on it and extends to the artificial culture medium later. A medium capable of inhibiting the growth of the common bacterial contaminants should be used for primary culture, and for this purpose the trypsinised serum tellurite copper sulphate agar of Allison and Ayling (1929) will be found particularly suitable. It has proved valuable in the primary cultivation of other fungi, especially ringworm fungi, and its initial reaction of pH 8 does not affect its usefulness in this work. Most of the cultures should be incubated at 24° C., or at room temperature, which favours the development of the more rapidly growing and more luxuriant cultures of the mycelial form of the fungus, but some should be incubated at 37° C. The initial colonies may be expected to appear between the 5th and 20th days or later.

There are two different forms of the fungus in saprophytic life—a mycelial form and a yeast-like form. The mycelial form develops very freely at room temperature, as well as at 37° C., on nearly all culture media, and bears the characteristic reproductive bodies (tuberculated chlamydospores) by which the species may readily be identified. The yeast form, which is morphologically similar to the parasitic stage seen in the lesions, but without the capsule, develops only at about 37° C. and only on particular media, such as blood-agar or coagulated serum. On these it may be obtained in primary culture from the morbid tissues. It may also be developed from the mycelial form by making a heavy sowing of the chlamydospores on blood-agar and incubating at 37° C., taking precautions to prevent drying. Under these conditions, the germ tubes arising from the chlamydospores do not develop a mycelium but bear bud cells, and these in turn bud off similar cells which, separating, continue to vegetate by budding, producing chains and groups of yeasts. Once established in culture the yeast form can be propagated indefinitely, unchanged, on the two media mentioned and on glucose-agar if the cultures are maintained at 37° C. and protected from drying. Active yeast-form cultures transferred to other media, or kept on any medium at room temperature, will slowly revert to the mycelial form.

Cultures of the strain of *H. capsulatum* from the case described here were found to be still viable after the following periods: the yeast form, up to 9 months on glucose-agar, capped and kept at 37° C.; the mycelial form, at room temperature, after 9 months in 10% sucrose solution, and with slow desiccation after 7 months on glucose-agar. These periods are longer than those recorded for survival of some of the American strains on other media.

The free-growing character and the resistance to drying of the mycelial form of the fungus suggest the possibility of a saprophytic life in wild nature, which might have a bearing on the epidemiology of the disease; but there is, as yet, no evidence of any such existence of the fungus, and the source of infection is not known. De Monbreun (1939) has described naturally acquired histoplasmosis in a pet dog, which may suggest the possibility of an animal source of the human infection. In the analogous mycotic diseases, coccidioidal granuloma and sporotrichosis, natural infections of some of the lower animals occur but the disease in man is usually attributed to infection by saprophytic forms of the fungi known to vegetate in wild nature. Evidence bearing on this problem might be furnished by animal experiments; De Monbreun (1934), by giving relatively large doses of a living culture of the yeast form of *H. capsulatum* intravenously to monkeys, produced a generalised invasion of the endothelial cells and death, with a histological picture resembling histoplasmosis. Apparently an attempt to cause infection with the mycelial form was not successful. Owing to war conditions, inoculation of animals with the fungus isolated from this case could not be undertaken. There is a promising field for workers to experiment with both forms of the fungus, using small inocula with the object of causing a progressive infection, and following as closely as possible the presumed natural routes of entry. Repeated failure to infect with the mycelial form may be expected, but should not be a deterrent to further experiment with this form.

We are grateful to Mr. S. A. Morgan and Mr. P. W. Purkiss for their technical assistance.

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ADVISERS ON CHILD CARE.—The Minister of Health in consultation with the President of the Board of Education has appointed four regional advisers on child care for the parts of the country where the work of arranging for the care of the children of employed women is likely to be heavy. Lady Reading will act as adviser for the midland region, Lady Openshaw for the north-western region, Mrs. Eva Hubback for the southern region and Mrs. T. Todd for the northern region. In London, Mr. H. U. Willink, regional commissioner for the care of the homeless, has also undertaken the general supervision of this work.

PULMONARY FAT-EMBOLISM

CLINICAL AND RADIOLOGICAL OBSERVATIONS

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ASSISTANT RADIOLOGIST

Note on Sputum Examination

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(*Illustrations on plate*)

IT has lately been suggested that fat-embolism is commoner than has been suspected, and Robb-Smith (1941) has reported a study of 115 fatal accidents in which fat-embolism was an almost constant finding, and in many cases was a major factor in the fatal outcome. Bearing in mind these findings and those of others, notably Harris, Perritt and MacLachlin (1939) in Toronto, and Rowlands and Wakeley (1941), we present the records and radiographic findings of four patients who have survived fat-embolism.

CASE 1

A man, aged 30, admitted to the Radcliffe Infirmary on Oct. 17, 1940, under the care of Mr. A. Elliot Smith, with simple fractures of the right tibia and fibula. There was some shortening of the limb, which was reduced with the Zimmer machine under general anæsthesia. Later, the patient was transferred to the Acland Nursing Home. On the 22nd he complained of sudden tightness in the chest and difficulty in breathing. He had no cough or pain and his temperature was 103° F. Next day, when he was seen by Dr. F. G. Hobson, he had well-marked dyspnœa at rest; respirations 40, pulse-rate 130 per min. and blood-pressure 120/70 mm. Hg. He was extremely pale and his head and neck were covered with a profuse purpuric eruption. Fine crepitations were heard throughout both lungs. A blood examination was carried out by Dr. D. Black, who reported as follows (normal values in parentheses):

"Hæmoglobin 44% (Haldane), red cells 2,300,000, white cells 17,800 per cu. mm. Plasma volume 4·8 litres (3). Hæmatocrit 20 (44). Blood volume 6 litres (5). Blood-urea 51 mg. per 100 c.cm. Plasma protein 6%. Plasma albumin 3·6%. Plasma chloride 600 mg. per 100 c.cm. Plasma bicarbonate 50·4 vol. per 100 c.cm. The blood volume and count suggest that the anæmia is due to loss of red cells into the bruised tissue or skin petechiæ, and to an absolute increase of plasma volume, analogous to hydræmic plethora of pregnancy. The increase in plasma volume has not been attended by any fall in plasma-protein concentration, so protein must have been mobilised from the liver and from tissue stores. Chloride is normal, and alkali reserve a low normal, while urea is moderately raised, as is not uncommon a few days after an accident."

The patient was given continuous oxygen by nasal catheter with considerable relief, and for two days his condition remained unchanged. On the 25th there was some improvement. Radiography of the chest (Dr. D. T. Barnes) on the 27th (fig. I) showed considerable consolidation and clouding of the lower halves of both lung fields. From this time onwards the patient steadily improved. Radiograms on Nov. 4 showed that the consolidation had disappeared. On Nov. 15 the report on the blood was as follows:

"Hæmoglobin 76% (Haldane), red cells 3,700,000. Plasma volume 4 litres. Hæmatocrit 36%. Blood volume 6·2 litres. Blood-urea 27 mg. per 100 c.cm. Plasma protein 6%. Plasma albumin 3·4%. Plasma bicarbonate 56 vol. per 100 c.cm. These results, in conjunction with those previously obtained, suggest that the main cause of the anæmia was blood loss into the traumatised area. The total red-cell volume increased by a litre in the interval between estimations. The increase of 1·8 litre in the plasma volume above normal value at the first estimation could account for only a small part of the observed anæmia. The blood chemistry is now normal."

Clinically this is a case of pulmonary and systemic fat-embolism, for the findings are characteristic—that is, after an interval of six days there was sudden respiratory distress associated with purpuric hæmorrhages over the neck and upper parts of the trunk. The physical signs were those of acute pulmonary œdema and the radiographic appearances were typical of this condition. There was no laboratory information to confirm the presence of fat.

CASE 2

A man, aged 32, admitted to the Radcliffe Infirmary at 8.30 A.M. on Feb. 5, 1941, 1½ hours after being hit by a car. Suffering from moderate shock, severe compound fractures of the right tibia and fibula, and minor cuts and abrasions of his face and hands. Temperature 97·8° F., respirations 20, pulse-rate 80 per min., blood-pressure 90/50 mm. Hg, hæmoglobin 80%. He was put in a warm room and given continuous oxygen at 5 litres per min. with a BLB mask. Later he was transfused with 1 pint of plasma. At 11 A.M. he complained of abdominal pain, and was tender on both sides above the umbilicus, but there was no visible abnormality or sign of fractured ribs. At 4 P.M. his respirations were raised and about this time he was radiographed. The films showed fractures of the tibia and fibula with some overlap and angulation; the lung fields were clear and no fracture of the ribs was seen. When he was seen by one of us at 7.30 P.M. his general condition was good (pulse-rate 84, BP 120/80). His respiration was rapid (30) and he was slightly cyanosed. Since there had been no injury to the chest and the radiogram showed no abnormality, fat-embolism was suspected. Operation was carried out at 8.30 P.M. under gas, oxygen and cyclopropane. The fracture was at the junction of the upper and middle thirds of the tibia and about 4 in. of bone was protruding through the wound. The wound was incised and excised in the usual manner, and reduction was carried out on a Zimmer machine. Plaster was applied with two pins in place.

For some days after the operation the patient complained of pain in the right lower chest and abdominal discomfort. His temperature rose to 100° F. in the evening, pulse- and respiration-rates were raised and he produced a little blood-stained sputum. On Feb. 6, the day after the injury, biochemical analysis of the sputum and urine showed considerable quantities of fat. Subsequent examinations showed fat still present but in much reduced quantities. On Feb. 11, the patient was much better and from then onwards rapidly improved. He never had any purpura or signs of a lesion in the central nervous system. In March he had brief attacks of pain in the upper abdomen and the lower chest on the right side, but no abnormal physical signs were detected. He was discharged well and walking with crutches on March 21.

Clinically, this patient showed slight cyanosis and a raised respiratory rate after the signs of shock had passed, and it is thought that these signs were due to pulmonary fat-embolism because he had no injury to the chest and the radiogram showed no abnormality. Fat was found in the sputum and urine next day, and in diminishing quantities at subsequent examinations. Unfortunately the sputum was not sent for microscopical examination, which would have been a more reliable test.

CASE 3

A woman, aged 39, admitted to the Radcliffe Infirmary on Aug. 22, 1941, with a fracture of the neck of the left femur sustained by a fall while shopping. There were signs of a fracture of the femoral neck but no contusion of the soft parts. She had no other injuries. She was very thin with a pale complexion and cyanosed lips. Her voice was husky and she coughed frequently. She had had a slight cough with a little sputum for three or four years, and frequent colds, and had had a bad cold for a fortnight before admission. Her temperature, pulse- and respiration-rates were normal. The chest showed signs of emphysema but no moist sounds or evidence of consolidation. Next day her temperature was 101° F. She had no pain but the cough was rather worse. The chest still showed no moist sounds. A radiogram (fig. II) showed large root shadows and generalised increased markings throughout both lung fields, interpreted as congestive changes with old-standing hilar adenitis. She continued to run an intermittent fever. Fat-embolism was considered and the sputum and urine were sent for analysis. The sputum contained a large number of neutrophil leucocytes and a few alveolar phagocytes. There were occasional globules of extracellular fat. On Sept. 3 the cough was rather worse and the temperature still raised. She had a sore throat and signs of follicular tonsillitis. There was impaired resonance of the chest at the right base and soft bronchial breathing, but no moist sounds. A radiogram showed mottling in the right lower lung and slighter changes on the left side, interpreted as pneumonic consolidation. The sputum now contained a large number of extracellular globules of fat, considerably more than in the previous specimens. There were numerous pus cells and the predominant organisms were

pneumococci. The whole picture suggested a pneumonic complication of fat-embolism. A radiogram two days later showed less consolidation at the right base and appreciable enlargement of the main trunk of the pulmonary artery. Ultimately the patient's condition settled though she continued to have a cough with sputum. The fracture was never manipulated and no anæsthetic was given. She was treated as a case of pneumonia.

This appears to be a case of pulmonary fat-embolism in a patient with chronic bronchitis. Subsequently she developed pneumonia and later recovered.

CASE 4

A man, aged 34, admitted to the Radcliffe Infirmary on the night of Sept. 3, 1941, having been knocked off his bicycle by a heavy lorry. The lorry wheel is said to have passed over the lower part of the front of his chest. He was a well-built man, shocked, pale, sweating and anxious; his respirations were rapid and shallow, temperature 98·5° F. and blood-pressure 100/70 mm. Hg. He had a lacerated wound on the inner side of the right thigh above the knee; the skin was severely damaged and the wound dirty. Radiograms showed a fracture of the shaft of the femur with shortening. There was bruising over the left lower ribs, diminished movement of the left chest and weak breath sounds; percussion note normal. No history of previous chest trouble. A radiogram (fig. III) revealed mottling throughout the left lung field, interpreted as pneumonic consolidation probably due to pulmonary concussion. The wound was excised and sutured under local anæsthesia. A Steinmann's pin was driven through the head of the tibia and the leg put up in a Thomas splint with 30 lb. traction. Three days later the temperature was 100° F.; chest expansion on the left side was very poor, the percussion note was impaired and the breath sounds were very weak. The hæmoglobin was 70%. On the 10th the physical signs were similar but a radiogram showed that the consolidation was resolving. The sputum contained numerous pus cells and an almost pure culture of *Staphylococcus aureus* was grown. On the 16th he was still coughing; the physical signs on the left side showed improvement. The sputum contained a large amount of extracellular fat with numerous neutrophil leucocytes. The appearances were very suspicious of pulmonary fat-embolism. On Oct. 10, temperature, pulse and respirations were normal and there were no abnormal physical signs in his chest. A radiogram showed clear lung fields. A month later he still had a little cough with small quantities of sputum. There was never any purpura or signs of a lesion of the central nervous system.

This patient sustained direct violence to the chest wall. Clinically and radiographically he was found to have extensive consolidation of the left lung, attributed to pulmonary concussion. Subsequently it was shown that there was pulmonary fat-embolism. He developed a bronchitis but not a pneumonia. Later he recovered, but has persistent bronchitis.

COMMENTS

There should be no difficulty in diagnosing typical cases of pulmonary fat-embolism, for the signs have been clearly described; but there are probably many more less severe cases than is generally realised. The diagnosis of every case with chest symptoms following an accident should therefore be carefully reviewed so that the frequency and clinical significance of fat-embolism may be known.

The value of radiology in diagnosis has yet to be assessed, for few records have been published. In cases with acute pulmonary anoxæmia it is unlikely that any useful information will be obtained, for the patients cannot keep still owing to respiratory distress and mental confusion. Later, when the acute signs have abated, it should be possible to obtain satisfactory radiograms, as in case 1, whose films showed clouding of the lower lung fields and numerous areas of consolidation—the radiographic findings of acute pulmonary œdema. Sopian and Scharles (1938), Whitaker (1939) and Kolmert (1939) have described similar changes. Such records are confirmatory evidence of the clinical state but are not essential in diagnosis, for the clinical findings are characteristic.

When clinical signs indicate that there may be a pulmonary lesion, a radiogram is of real assistance, for it will exclude all severe injuries of the chest and pre-existing disease. Blair (1941) has pointed out that good films are essential at the earliest possible moment. Many relatively minor injuries, such as fracture of the ribs, small effusions, or injuries to the lower lobes of the lungs, may not be visible in films taken in the wards and require the special facilities of a main radiographic department to demonstrate their presence, for the usual postero-anterior projection reveals only about two-thirds of the lungs and many portable films show much less.

With proper radiographic technique, we may form a clinical conception of degrees of fat-embolism not severe enough to produce acute pulmonary œdema. There is definite post-mortem evidence of these but little is known of their clinical significance. Three of the cases described here had no characteristic clinical features of fat-embolism. In case 2 there were signs of considerable respiratory deficiency and the radiogram showed no abnormality, but the clinical suspicions of fat-embolism were justified when quantities of fat were found in the sputum and urine next day. From this case it seems that considerable quantities of fat may be held up in the lungs, sufficient to cause definite functional impairment, without producing radiographic changes. Similar findings were at first found in case 3. This woman had long-standing chronic bronchitis and emphysema which must have considerably reduced the efficiency of her pulmonary capillary network. Though there was no evidence of severe contusion at the site of injury, sufficient fat was probably liberated to cause a degree of fat-embolism which might not have inconvenienced a normal person but for which she was unable to compensate owing to an inadequate collateral capillary circulation. Her bronchitis became worse and she developed consolidation at the right base. The radiographic appearances were consistent with these findings except in one respect—that is, a film taken sixteen days after the accident showed an appreciable enlargement of the trunk of the pulmonary artery which was not shown in previous films. In case 4 the clinical and radiographic findings were those of pulmonary concussion of the left lung and the right lung seemed normal. Such fat-embolism as was present appeared to be without clinical significance.

The diagnosis of pulmonary fat-embolism by radiography of the chest was investigated by Jirka and Scuderi (1936) in dogs. They describe a diffuse haziness or cloudiness of the pulmonary fields which developed within 20 min. after oil had been injected into the blood-stream, and concluded that radiograms should be of definite diagnostic aid in patients suffering from clinical fat-embolism. Their published films do not furnish convincing proof of their statements because they show significant technical variations. In some films the shoulder girdles have not been drawn clear of the chest and in others the animal has not been held straight. The shoulder girdles must be drawn clear or the upper lung fields appear relatively opaque, and if the animal is not held quite straight one or both lungs may show opacities or diminished translucency due to relative compression of the lung or to folds of skin. Their interpretation of the radiogram of the lungs after their removal from the chest is also questionable, for unless the trachea is clamped or tied before the chest is opened the lungs collapse and may show radiographic appearances similar to those illustrated.

Dr. A. E. Barclay, Dr. K. J. Franklin and Miss M. M. L. Prichard, of the Nuffield Institute, Oxford, allowed us to examine the records of their experiments on adult cats and rabbits. By cine-radiographic studies of the heart and lungs they followed the course of globules of iodised oil entering the thorax through the superior or inferior vena cava. The oil collects in the most dependent parts of the lung, and considerable quantities may accumulate before there is any diminution in pulmonary translucency. When the pulmonary vessels are well filled the lung becomes clouded; the appearances are then similar to those in case 1 and may be attributed to pulmonary œdema. These experiments did not induce fat-embolism comparable to that observed in fracture cases, and we do not know whether œdema would have developed with much smaller quantities of oil if the animal had been kept under observation. Further, iodised oil tends to be held up in the larger branches of the pulmonary artery, whereas the fat globules derived from tissue trauma are mostly much smaller and pass into the arterioles and capillaries. Nevertheless, the experiments seem to confirm the clinical impression that considerable quantities of fat must be present before there are any appreciable radiographic changes.

SUMMARY

The records of four surviving cases of pulmonary fat-embolism are given. Only one had characteristic clinical or radiological signs.

Radiography of the chest may be of some assistance in diagnosis of pulmonary fat-embolism. Cases with acute pulmonary anoxæmia show considerable diminution of translucency of both lung fields and patchy mottling, the signs of acute pulmonary œdema. Less severe cases may show no abnormality. It is suggested that considerable quantities of fat may be retained in the lungs, sufficient to cause definite respiratory embarrassment, without producing radiographic changes.

We wish to thank Mr. Elliot Smith and Dr. Hobson for permission to publish the records of case 1.

Examination of Sputum in Suspected Fat-embolism

Warthin first suggested the examination of the sputum in cases of fat-embolism, and since that time it has been regarded with varying degrees of favour. The method which has been adopted here is as follows.

1. Make a thick smear of the sputum (by squeezing between two slides) covering two-thirds of the surface of the slides.
2. While the smear is still wet flood the slide with Sudan IV solution and leave for three minutes.
3. Rinse in tap water.
4. Counterstain with hæmatoxylin solution (either Weigert's iron hæmatoxylin or Ehrlich's acid hæmatoxylin) for three minutes.
5. Rinse in tap water.
6. Differentiate if necessary in 1% acid alcohol.
7. Blue in tap water.
8. Mount in Apathy's medium or glycerin jelly.

The Sudan solution is prepared by making a saturated solution of Sudan IV (Revector 258) in equal quantities of acetone and 70% ethyl alcohol.

In examining the stained specimens microscopically, the size and number of the fat globules should be noted together with the general morphology of the sputum. In fat-embolism the fat is in the form of extracellular globules varying from 10 to 40 μ in diameter and there is a moderate neutrophil cytology. Histiocytes containing fat globules are not significant, for they are commonly found in chronic pulmonary disease. It should be recognised that all that can be stated is that extracellular fat is present and that the appearances are compatible with fat-embolism. If the patient has recently taken a meal containing fat the sputum may be contaminated by fat-containing saliva, and the presence of large numbers of buccal epithelial cells should make one suspect that the specimen does contain saliva. In a case of inhalation pneumonia, the sputum contained striated muscle-fibres as well as extracellular fat and the finding confirmed the diagnosis of inhalation pneumonia, but gave no information with regard to fat-embolism. Fat should not be expected in any significant amount in the sputum until at least 36 hours after the onset of pulmonary symptoms, and in cases of fat-embolism usually increases in amount during the succeeding few days.

I am indebted to my assistant, Mr. Reginald Duffett, who evolved this method of staining the sputum.

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Reviews of Books

Development of the Sciences

(2nd series.) Editor: Prof. L. L. WOODRUFF. London: Humphrey Milford, Oxford University Press. Pp. 336. 18*s.* 6*d.*

THE second series of public lectures given by members of the Yale University scientific staff are difficult to classify. As public lectures they might have been expected to present the intelligent layman with an account of the progress and present position of the various branches of knowledge with which they deal; but not all the authors are equally successful in this attempt. Some seem to find simple exposition of an abstruse subject too difficult; or forgetting their audience, employ a phraseology which is incomprehensible without previous training. The art of popularising scientific progress is not easily acquired. The familiar gibe against our own profession that we wrap up simple propositions in obscure jargon is often deserved. Language habitually—if not properly—used in addressing an advanced class is ill-adapted to the popular lecture. The lectures present a historical sketch of the rise and development of the special subject followed by a review of current knowledge and hypotheses. The articles which best fulfil the aim of education of the layman are those on geology and biology, because in both the lecturers have been careful to use language which if not ordinary is at least accurately explained.

The close interdependence of all lines of scientific inquiry is made clear. Now one science, now another makes a striking advance into the unknown and is almost immediately followed by all the others, so that the line is again straightened and the salient swallowed into a new front from which a new salient may be pushed out in an entirely different direction. Sometimes the advance is made, not through the efforts of the scientific expert, but through the unexpected results of commercial enterprise; for instance much of our more recent knowledge of geology derives from the researches of the petroleum industry; and the industrial chemist has sometimes made discoveries which have broader meanings than he realises. Progress seems to have been rapid in the last generation, yet as Professor Woodruff says, "the end of the journey is still far below the horizon." And always will be; ahead

> "Gleams that untravelled world whose margin fades
> Forever and forever as we move."

Tropical Medicine

(4th ed.). Sir LEONARD ROGERS, M.D. Lond., F.R.C.S., F.R.S.; Sir JOHN MEGAW, M.B. Belf. London: J. and A. Churchill. Pp. 536. 21*s.*

THIS work first saw light in 1930, and has since become one of the standard textbooks. Fresh material has been added to the new edition but the number of pages has been slightly reduced by judicious pruning. The classification of diseases, however, is not wholly satisfactory; it is a pity, for example, that amœbic hepatitis and liver abscess should be separated from amœbic dysentery by about half the volume, and that cutaneous leishmaniasis should be similarly divorced from the visceral disease, though post-kala-azar dermal leishmaniasis is dealt with under the heading of its precursor, kala-azar. Espundia, the mucocutaneous leishmaniasis of South America, receives rather inadequate attention. Except for ankylostomiasis, the common intestinal helminthiases escape notice, and so do cysticercosis and paragonimiasis, trachoma, Rift Valley fever and psittacosis. The essential features of the treatment of blackwater fever are well set out, but it might have been wise to emphasise that alkalis are given to make and keep the urine alkaline, so as to forestall the formation of acid hæmatin which may block the renal tubules and cause anuria. In the section on tick-borne relapsing fevers no differentiation is made between the Central African form conveyed from man to man by ornithodorus and those tick-borne fevers, found elsewhere, which are sporadically acquired from various mammals through sundry ticks. In the section on the typhuses, recent American work—which apparently proves the mutation of the flea-borne endemic murine disease to the louse-borne epidemic form in Mexico—should surely have found a place; and the fact that the habitat of the organisms of the tick-borne typhuses is intranuclear while that of other forms is intracytoplasmic is at least as valuable in differentiating them as minor morphological differences, which are never very distinctive with such pleomorphic organisms. The constitution of 'Fouadin,' used in the treatment of bilharziasis, is not accurately given and the dosage is incorrect—an error perpetuated from the previous edition. In 1942 sulphaguanidine merits mention in the treatment of bacillary dysentery, as do the sulphanilamide drugs in that of lymphogranuloma inguinale. But these are chiefly errors of omission, and the book as a whole contains much useful material for students and practitioners of tropical medicine.

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THE LANCET

LONDON: SATURDAY, FEBRUARY 21, 1942

CHOOSING THE FIGHTER

THE members of our Fighting Services need to be both numerous and efficient, and too close an attention to one of these attributes by selecting boards interferes with the attainment of the other. The more carefully men are selected the fewer pass through the sieve; conversely, high quantity means poorer quality. Fortunately doctors have enough experience of the wide range of what is normal and healthy to abstain from rejecting men who have a defect that has not interfered with active civilian life; fortunately, too, the Army is a highly organised body within which men of diverse physical and mental capacity can find a useful place. It would be a sorry thing if examining medical boards assumed that the Services could only utilise men with the equipment of mind and body required, for example, by an RAF pilot or a member of the Royal Armoured Corps. But that does not mean that we should imperil efficiency by recruiting the halt and the maimed, the dull and the crazy. Since physical disabilities can be recognised with some certainty, and standards of rejection or classification laid down for all to go by, there is little chance that the halt and the maimed will be admitted except where their advent is foreseen and provided for—the Pay Corps will have different standards of suitability from the Pioneer Corps, yet both may absorb men unsuited for an infantry regiment. But where mental standards must be attained, clear guidance and the certain recognition of the unfit may be very hard to come by. A standard of intellectual level may be set up, expressed in terms of percentile rating, as explained by SLATER in our columns[1]; but men may unwittingly or by design obtain a disqualifyingly low score, not representative of their real intellectual capacity. RAVEN[2] has lately indicated how important it is for the assessor to be aware of the varied influences thus reducing a score. But intellectual defects are not the only psychological ones which will disqualify a man for military service; psychopathy of various sorts can be more disabling, more dangerous in a fighting unit than dullness or physical handicaps. Yet it is no simple task to spot all the neurotics who will be incapable of useful military service, the men of psychopathic personality who will be detrimental to morale, the early schizophrenics, the potential suicides and the drunkards. It is possible, however, to over-emphasise this difficulty; there are plenty of men unsuitable because of mental disabilities who can be spotted by doctors of average experience, even without special training, if they are on the watch for such cases and can take the time to examine them.

Moral considerations sometimes bedevil the question. The doctor says to himself, "This man reports all sorts of neurotic symptoms, but I have no objective evidence that what he says is true; it may be he is only trotting these things out to throw dust in my eyes and evade military service; if so, I will see that his contemptible design is thwarted." Clearly the question to be answered by the doctor is whether the man has a disqualifying illness, constitutional or otherwise—not whether his motives are laudable or shameful. Some hold that the examining boards of the Ministry of Labour have not, on the whole, been able to detect as often as desirable the man who had later to be discharged from the Services on psychological grounds; others that any other system than that followed would have allowed a large amount of good material to slip back into the civilian sea, if the net had had too wide a mesh. The problem has been tackled in the United States[3] under less urgent conditions. Psychiatric examination has been as important in the procedure of the examining boards there during the last twelve months as the examination of the somatic systems. At one medical induction board[4] 9652 minimal neuropsychiatric examinations were made between Feb. 13 and April 15, 1941, with the consequent rejection of 2·5%—that is, of 242 men, more than a third of whom had some mental deficiency. The examiners considered, however, that a further 6% of the men accepted for military service were dubious, on neuropsychiatric grounds, and they thought it important to designate such men as "borderline" at the outset and to ascertain their subsequent military history; thus a well-founded revision of existing standards of suitability, in either direction, might be made. The writer of the article adds pointedly: "There is, in fact, just as much need to classify examiners as to classify examinees, in order that statistical evidence in the future may be interpreted correctly in terms of the minimal standards set for scientifically trained psychiatrists." The problems and resources of the U.S., however, are not identical with ours. Here, it is probably correct to say, some men have been accepted for the Services whose disabilities, physical or psychological, could have been detected without hesitation if there had been either more time or more care expended on the initial examination; but the number, among these, with psychological defects obvious at the time of examination is not particularly large in comparison with those whose disabilities have come to light later, under the conditions of military training or active service. Only people confident in wisdom after the fact would insist that men in the last category could certainly have been detected by doctors who are not specialists in the psychiatric field.

The task would be easier if we all knew where character stops and disease begins. Is psychopathic personality a disease? Is eccentricity? Is delinquency? It may be as easy to say "No" as to assert that a person with a still symptomless carcinoma is not ill or that low sugar-tolerance is not in itself a disease. Whether the comparison be exact or not, such problems are commoner in psychological than in physical medicine. COOK and SARGANT[5] point out that the recognition of psychological illness is as important and economical a procedure as the recognition of physical disease. Moreover it should be borne in mind that physical disease often gives rise to a neurotic syndrome. The constitutional psycho-

1. Slater, P. *Lancet*, 1942, i, 101 2. Raven, J. C. *Ibid*, p. 115.
3. Menninger, W. C. *War Med.* 1941, **1**, 843.
4. Aita, J. A. *Ibid*, 1941, p. 769.
5. Cook, G. T. and Sargant, W. *Lancet*, Jan. 10, 1942, p. 31.

pathy has lain dormant and symptomless until some physical change has made possible its manifestation. The physical change may have been one of cerebral structure and function, or it may have reduced or imperilled the integrity of some other parts of the body, so causing the fears and griefs which are the patient's reaction to a corporal threat. The physician examining such patients must be equally on the alert for physical and mental disabilities; he neglects or ever-emphasises either at the patient's peril, and he must pay regard not only to the symptoms under his nose (if he sniffs in the right direction) but also to the constitution out of which they have developed—something which he cannot by any means detect and diagnose as easily as he can a symptom-picture. The problems of what has come to be called "psychosomatic medicine" are complicated. They are certainly not to be solved solely by a study of the psychological history of every patient (whether with physical or mental disease) nor by a study of the somatic state and history of every patient, but by a combination of these, critically carried out so that causes are not mistaken for effects, or concomitant phenomena for successive ones in a causal series. There is also a wide difference between a neurosis masquerading as a physical disease (as in effort syndrome, hysterical blindness or alleged failure of dark-adaptation), a physical disease with partially psychological origins (such as a severe hysterical contracture), and a physical disease aggravated by psychological changes, as a gastric ulcer may be.

VIRUS OR VITAMIN ?

STOMATITIS has long been recognised as a common disorder in infants and children with a rise in incidence during the latter months of the year; thus, in the autumn of 1938, five per cent. of the outpatients seen at a large children's hospital suffered from this complaint. Last autumn the disease increased in frequency and almost assumed epidemic proportions; moreover, adults were chiefly affected, particularly troops and munition workers. As a result there have been speculations about the ætiology. The cause of certain forms of stomatitis is known—thus it occurs with vitamin deficiencies, particularly of C and the B complex; in some infections, such as diphtheria, thrush and the exanthemata; and in certain blood diseases, such as leukæmia and agranulocytosis. But as a rule the cause is unproven, which partially explains the numerous synonyms—more than 30—given to the disorder. Another reason for this multiplicity of labels is that the disease has many manifestations—catarrhal, aphthous, ulcerative, membranous, gangrenous. The widespread incidence of ulcerative stomatitis and marginal gingivitis among troops on active service in the last war produced another title: "trench mouth." Sometimes there is a false membrane on the tonsils typical of Vincent's angina; at others a similar false membrane is present on the gums and adjacent tissues, smears from which often show the fusiform bacilli and spirochætes associated with Vincent's angina, and hence the condition has been called fusospirochætal stomatitis. In a series of 115 cases in children, 67 being under the age of two years, PARSONS[1] found that the clinical manifestations and ætiology differed in infants and in older children. In those under two the disease occurred chiefly in the artificially fed or those who made use of dummies, and, even when aphthous ulceration was the chief sign, was usually due to thrush. The mouths of these infants had little or no odour and the cervical glands were not enlarged, but sometimes, albeit rarely, they developed thrush œsophagitis, a fatal complication first adequately described by EBBS.[2] On the other hand, in the older children, the stomatitis, although often complicated by aphthous ulceration, was of the Vincent's type, and inflammation, offensive odour and glandular enlargement were the rule. The disease in older children, therefore, resembles that seen in adults, and because of the fœtor is sometimes called fœtid stomatitis, although BLACK[3] prefers the title acute infectious gingivostomatitis.

The evidence in favour of a causal relationship between the vitamin-B complex and stomatitis was reviewed in these columns two years ago.[4] In view of the facts that KING[5] had successfully treated Vincent's angina with nicotinic acid, which is usually accepted as the chemical expression of the PP or pellagra-preventing factor, and that SEBRELL and BUTLER[6] had cured cheilosis, a form of angular stomatitis, with another component of the B complex, riboflavin or lactoflavin, two conclusions were reached. These were, first, that nicotinic acid and riboflavin, either alone or in combination, have a therapeutic action on the mouth lesions of pellagra and prepellagra, and secondly, that nicotinic acid cured the various forms of gingivitis and stomatitis associated with the presence of Vincent's organism. It was also pointed out that nicotinic acid might act because it was lethal to these organisms or rendered the medium unsuitable for their growth, or because it improved the condition of the underlying tissues, thus preventing them obtaining a foothold. There are, however, certain difficulties in a wholehearted acceptance of the vitamin-deficiency theory. For instance, there is little evidence that the vitamin deficiencies have materially increased since the war, either in children or adults, for which due credit must be given to Lord WOOLTON and his medical advisers and to the disappearance of unemployment. Moreover, the epidemic of stomatitis has occurred among troops who have a well-balanced and sufficient dietary, and although the epidemic now shows signs of fading away there has not been any corresponding dietary change in the Army or in the civil population. Again, many of the recent cases have not shown a rapid or complete cure with nicotinic acid; indeed, they have improved as quickly with simple saline mouth-washes as with nicotinic acid. Improvement may be rapid at first with both forms of treatment, but then the condition may hang fire and complete cure be long delayed. The best results are obtained when the patient receives careful and efficient dental treatment, and PARSONS suggested in his letter last week that this explains the good results achieved by STUHL and COVENTRY,[7] rather than the exhibition of moderate doses of vitamin C. Lastly, the infectious nature of stomatitis is difficult to explain from a vitamin deficiency,

1. Parsons, C. G. *Arch. Dis. Childh.* 1940, **15**, 43.
2. Ebbs, J. H. *Ibid*, 1938, **13**, 211.
3. Black, W. C. *Amer. J. Dis. Child.* 1938, **56**, 126.
4. *Lancet*, 1940, ii, 46.
5. King, J. D. *Ibid*, p. 32.
6. Sebrell, W. H. and Butler, R. E. *Publ. Hlth Rep., Wash.* 1938, **53**, 2252; 1939, **54**, 2121.
7. Stuhl, F. and Coventry, J. B. *Lancet*, 1942, i, 153.

though it might be held that the disease is a "conditioned infection," the infection being conditioned by the vitamin shortage. In the stomatitis associated with scurvy there is no evidence that the number of fusiform bacilli and spirochætes in the mouth is increased,[8] and this supports the view that there is some specific relationship between nicotinic acid and Vincent's organisms, but a considerable body of opinion regards the fusospirochætal organisms as secondary invaders. According to BLACK, there is no proof that the mouth spirochætes, fusiform bacilli, spirilla or vibrios, singly or in any combination, are capable of initiating infection in man.

If vitamin deficiency and infection by fusospirochætal organisms are both unproved causes, is there reason for blaming some other infection? With the exception of thrush, convincing evidence to connect any specific bacteria with the common forms of the condition is lacking; many organisms have been found in infected mouths, but since they are chiefly those found in the healthy mouth they seem likely to be secondary invaders. Even so, they may become pathogenic, and it has been suggested that in young children thrush may act as the primary cause of Vincent's stomatitis, by preparing the ground on which the secondary invaders become active. It is true that rarely stomatitis is associated with a specific bacterial infection, but these instances do not solve the general problem of causation. For instance, stomatitis sometimes occurs in diphtheria, and gonococcal stomatitis has been reported. WALTON, GRAHAM and LANSDOWN[8] have described three examples of ulcerative stomatitis in soldiers, in each of whom a diplococcus was obtained in smears and pure culture which was gram-positive and encapsulated but lacked many of the cultural, biological and serological properties of the pneumococcus. This stomatitis did not respond to adequate sulphapyridine therapy, although transfusions of pooled whole blood seemed to act as a specific. The mouths of these patients resembled those in Vincent's disease, but the unpleasant odour of that condition was absent, and WALTON and his colleagues suggest that the blood-transfusions may have remedied a deficiency, perhaps of nicotinic acid, which had allowed infection with the diplococcus to occur. There is, however, increasing evidence that stomatitis commonly arises from a virus infection. Thus DODD, BODDINGTON and JOHNSTON,[9] by inoculation into the cornea of the rabbit, produced from 27 out of 28 children suffering from gingivostomatitis lesions typical of those produced by the herpetic virus, and they demonstrated immunity to a known strain of herpetic virus in 7 out of 8 rabbits which survived the primary infection. According to these workers, the disease is either transmitted from child to child or acquired from adults with labial herpes. This work, which was done under the supervision of GOODPASTURE, does not furnish a complete answer to the question of causation because the herpetic virus has been recovered from the saliva of normal people, but if, in addition to finding the virus in the saliva of patients, antibodies against the virus were found in their blood, the evidence in favour of the virus as a causal factor would be greatly strengthened. Such evidence has recently been produced by MCNAIR SCOTT and STEIGMAN,[10] who not only isolated the virus of herpes simplex from the mouths of children suffering from acute infectious gingivostomatitis but also found herpes-neutralising antibodies in their blood during convalescence. They agree that the Vincent's-angina type of stomatitis is rare in infants, and say that herpetic stomatitis can be divided into two groups, primary and recurrent. Primary herpetic stomatitis, which occurs in people who have not previously been infected with the herpetic virus, is the common stomatitis of children and shows the clinical picture of an acute systemic infection characterised by fever, irritability, soreness of the mouth, red swollen gums, oral fœtor and enlarged cervical glands. The recurrent form may occur at any age after a primary infection with herpes, and is analogous to recurrent labial herpes; the local lesion may be severe and constitutional symptoms may be mild or absent. They suggest that trench mouth may represent a primary herpetic infection in older people who have escaped a childhood infection.

There is not yet sufficient evidence to form a definite judgment as to which of the two main schools of thought concerning the ætiology of ulcerative stomatitis is right—the vitamin-deficiency school or the herpes school. Present opinion seems to rule out bacterial infection as the primary cause but to regard bacteria as secondary and possibly unimportant invaders. It may be said that in infancy thrush can be accepted as the proved commonest cause of gingivostomatitis, but that in older children and adults the most convincing evidence so far adduced supports the view that the disease is due to infection with the virus of herpes simplex.

THE CORPSE AT LAW

WHEN a relative dies the layman is becoming ever more critical of his treatment and often expresses a doubt whether the doctor really knew what was wrong with him. This embarrassing interest may keep the defence societies busy, but the layman's interest in diagnosis should support the doctor's desire to look and see, and so remove one of the difficulties in obtaining the routine section which all pathologists regard as essential for the advancement of medicine. Doctor and relative being agreed there remains the material side of the problem, for we can only repeat what we had to say 8 years ago[11] that autopsies often have to be made under indecent conditions and in the complete absence of technical equipment. That was partly the result of an antiquated statute, mentioned by a peripatetic correspondent (p. 237), which forbad the removal of a corpse outside the parish. But if that was valid within our time it lost its validity in 1936 when public-health legislation was codified and reissued in convenient form. Section 141 of the Public Health Act 1875 said that a local authority *might*, and if required by the Local Government Board *should*, provide a mortuary; and s. 143 said "any local authority *may* provide and maintain (otherwise than at a workhouse or at a mortuary)" a post-mortem room. These sections were repealed and replaced by s. 198 of the 1936 Act. The old LGB had always insisted that the s. 141 room must be different from the s. 143

8. Walton, C. H. A., Graham, H. M. and Lansdown, L. P. *Ibid*, 1941, ii, 214.
9. Dodd, K., Boddington, J. and Johnston, L. *Amer. J. Dis. Child.* 1939, **58**, 907.
10. McNair Scott, T. F. and Steigman, A. J. *J. Amer. med. Ass.* 1941, **117**, 999.
11. *Lancet*, 1934, i, 355.

room (which must be "otherwise than at a mortuary"). It was apparently ruled in the old days that the coroner could not send a body to a mortuary for section but could order an autopsy on a body lying in a mortuary. The new s. 198 of the 1936 Act telescopes ss. 141 and 143 into one and says: "A local authority or a parish council *may*, and if required by the Minister *shall*, provide" (*a*) a mortuary and (*b*) a post-mortem room, and may make by-laws as to management and charges. This seems an improvement on ss. 141 and 143, because under s. 143 the local authority could not be required to provide the p.m. room: but under the 1936 Act it can be; and there is nothing to say that the p.m. room may not be at the mortuary any longer. Whether or no Elizabethan law prohibited the corpse leaving the parish, common law certainly laid on parish authorities the duty of providing some place for a corpse; presumably with some restriction on its removal because that might hamper the evidence for the coroner. Under the Coroners Amendment Act 1926 a coroner can now arrange for removal of a body out of his jurisdiction if he wants another coroner to inquire; the body may be brought back again (s. 16); and, if the coroner directs or requests a post-mortem, he may order the body to be removed to any place provided for the purpose within his jurisdiction (which, of course, is vastly wider than a parish), "or within any adjoining area in which another coroner has jurisdiction" (s. 24.) Adjoining coroners can therefore pool accommodation for post-mortems. And finally the wording of s. 198 of the 1936 Act makes it clear that the Ministry of Health, if it likes, can insist on proper post-mortem accommodation. It remains to say that the position in London comes under another statute; but then London has had for many years public mortuaries that could stand comparison with an operating theatre.

Annotations

WIND IN THE BOWEL

MUCH of the gas in the intestines is the unabsorbed residue of air swallowed with food and drink, or, in those who have the trick, alone. The composition of this air changes as it passes along the alimentary tract, because of the different diffusion-rates of its contained gases, and nitrogen is the main constituent of the residue in the colon. Gas is formed in situ, especially in the colon, by the bacterial fermentation of cellulose and starchy food. Hence vegetarians and other hearty eaters of carbohydrates, like the herbivora, have always been subject to distension, borborygmi and the passage of flatus, and the greater amount of vegetables and bread eaten in war-time seems to have led to some increase in flatulence. These gases are mainly composed of carbon dioxide and methane, and, as schoolboys are fond of demonstrating, are sometimes inflammable. During its passage along a healthy bowel gas is absorbed by the intestinal veins, and its excretion by the lungs is a common cause of foul breath. Absorption may be interfered with by causes producing general venous congestion, such as heart-failure and pulmonary disorders, portal congestion, as in cirrhosis of the liver, or local venous congestion, as in volvulus, and gas will then accumulate even though there is no abnormal amount of carbohydrate fermentation going on. "Toxic" effects on the intestinal mucosa interfering with absorption may account for the meteorism of typhoid fever, and for the distressing distension of pneumonia, diphtheria and other infections. Sir Arthur Hurst, who draws attention to defective absorption as a cause of distension on another page, thinks it as common a one as intestinal carbohydrate dyspepsia. Defective absorption can probably be carried a stage further, for if the tension of carbon dioxide in the intestinal tissues and veins rises above that in the lumen diffusion will be reversed and carbon dioxide excreted into the gut. The flatulence of intestinal carbohydrate dyspepsia can always be relieved by limiting carbohydrates in the diet, but this has little effect on distension due to faulty absorption, and purgation may also be ineffective. Here treatment will depend on the cause, but Hurst in the case he describes, where the cause seems to have been a previous partial volvulus, gives a striking radiological demonstration of the efficacy of posterior pituitary extract in producing an immediate, thorough and painless evacuation of flatus. A daily injection of 'Pitressin' freed his patient from all discomfort with no ill effects, and she has been able slowly to reduce the dose. Mathez,[1] of Lausanne, who has made a detailed radiological study of meteorism in three cases of pulmonary tuberculosis, also found posterior pituitary extract strikingly effective, though he ascribes its success to its action in improving capillary circulation, whereas in Hurst's patient it clearly worked by instituting mass peristalsis. The papers by Hurst and Mathez draw attention to two other facts—what unexpected symptoms gas in the colon may produce, and how little the aerodynamics of the intestine have been studied radiologically.

FATIGUE IN AIRCRAFT PILOTS

BETWEEN 80% and 90% of civil aeroplane accidents in the United States are ascribed to "pilot error." That is to say, the expected hazards of flying, unexpectedly bad weather, low cloud, fog, icing, lightning and other acts of God, as well as all the mechanical defects—engine failure and the rest—account for only a little more than a tenth of all aeroplane crashes. McFarland[2] says that "in the early stages of the war the British pilots were evidently losing more planes in landing accidents in returning home from abroad than during actual combat with the enemy." Whether this was so or not, anyone who has experienced the weariness produced by eight or ten hours of operational flying knows that many of these crashes were also due to pilot error, for the inefficiency of fatigue must have played an important part. McFarland has reviewed the subject of fatigue in aviation and has assembled the main causes, as have Armstrong[3] and others before him. In civil aviation many of the causes of fatigue can be modified, but in war flying some must of necessity remain unchanged. Fatigue in war flying arises from physical and psychological stress. Some of the physical causes of fatigue can be lessened, although the requirements of operational flying and the design of combat planes present many difficulties. For instance, engine noise, vibration, glare from the fuselage, the discomfort of cramped positions, cold, difficult instrument reading at night, and even uncomfortable clothes all play a part and must be considered individually in relation to the pilot and to his duties. Other causes, often overlooked—irregular working hours, long periods of duty, curtailed sleep or unaccustomed hours of sleep with consequent alteration in feeding and living habits—must add considerably to the fatigue factors in a pilot's life. The physiological effects of prolonged flying at very high altitudes—30,000 ft. or more—or of repeated ascents and descents are not yet fully understood, but it is known that intellectual efficiency is diminished at heights over 12,000 ft. largely because of the relative anoxia.[4] It is even thought that there may be a cumulative ill effect from high altitude resulting in physical and mental

1. Mathez, J. A. *Helv. med. Acta*, 1941, **8**, 525.
2. McFarland, R. A. *New Engl. J. Med.* 1941, **225**, 845.
3. Armstrong, R. G. Aviation Medicine, London, 1939.
4. McFarland, *Res. Publ. Ass. nerv. ment. Dis.* 1939, **19**, 112.

deterioration.[5] But the factors which are most pernicious in producing fatigue in pilots and other members of aircrew in war-time are psychological. Viteles [6] has divided fatigue into three related phenomena: "an overt manifestation in the form of reduced output in the task, known as work decrement; a physiological state involving changes in organic functions and the production of chemical products of fatigue; and a feeling of fatigue or tiredness." Now physiological evidence shows that fatigue of the degree met in man cannot be related to any peripheral changes; it is central in origin, and more psychological than physiological too. Thus, although the pilot does not perform much physical work, and although intellectual work appears to require no extra energy in terms of calories [7] he can still become exhausted with fatigue. Of the psychological causes, there are of course all those inseparable from Service life, those related to flying as such, and those arising from operational flying. The first group include lack of sleep, alteration in the routine of life, uncertain leave, and frank overwork. In the second group there is the alertness and constant vigilance needed in flying, the fine coördination, and the constant anxiety, for almost all seasoned pilots confess that they are aware of the dangers of aviation. In operational flying awareness must be acute, the possibility of battle is always ahead, and if the bomber pilot avoids combat he has the anxiety of locating his target, evading "flak," searchlights and pursuit, and then finding his way home, often in hazardous conditions. It is little wonder then that pilot error increases significantly at the end of an operational trip, for the first of Viteles's phenomena of fatigue, work decrement, has then begun to operate. The problem of fatigue, which in peace-time was the affair of the industrial psychologist, has in consequence become one of the main concerns of the Royal Air Force doctor and his scientific advisers.

TYPHUS FEVER CONTROL

ENGLISH doctors have had little enough opportunity for many years now to become familiar with typhus at home. Thus when occasional cases have appeared they have sometimes been misdiagnosed, and preventive measures have not been taken as soon as they might have been. The continental epidemics make it necessary for us to prepare for cases here, and the Minister of Health proposes to form a panel of 8 or 10 men living in different parts of the country, who have clinical experience of the disease. These will be able to help with diagnosis in and about the districts in which they live. Several suitable men are available in London, Lancashire, Yorkshire and the North Midlands, and Sir Wilson Jameson, the chief medical officer of the Ministry, would like to hear from medical men or women in other parts of England and Wales who have the necessary clinical experience and who are willing to have their names put on the panel. The Ministry will provide a fee of five guineas, with out-of-pocket expenses, when any member of the panel is called upon to act.

INTRAPERITONEAL SULPHONAMIDES

THE employment of sulphonamides in the peritoneal cavity is a logical outcome of the position they have attained in the local treatment of wounds, though Newell [8] successfully treated two cases of pneumococcal peritonitis with intraperitoneal injections of sulphanilamide early in 1939, before its success in wound therapy had been established. Last year Throckmorton [9] conducted a series of experiments in rats where various members of the sulphonamide group were introduced at laparotomy and the peritoneal exudate was withdrawn and examined at subsequent intervals. After laparotomy only the polymorph concentration was but slightly raised and subsequent adhesion formation was minimal. Sulphanilamide was completely absorbed in twelve hours and had practically no irritant effect, judged by the cellular response. By contrast, sulphapyridine was extremely irritant; masses of the powder were found walled off as long as 14 days after its introduction and adhesions were common. Sulphathiazole, on the other hand, although less soluble than sulphanilamide had no irritant effect. In contrast to sulphanilamide it excited a prolonged leucocytic response, thereby enhancing the local defence mechanism. Other sulphonamides tested had a definite irritant action. From these results the choice seems to lie between sulphanilamide and sulphathiazole, the latter having the advantage of a more long-lasting effect.

In established peritonitis sulphonamides in the peritoneal cavity are being increasingly employed. Mueller [10] was one of the first in this field and has had successful results for over two years. Complications were diminished, and he now employs the method as a routine in cases of abdominal infection. Thompson [11] and others have also been using sulphanilamide locally in appendicitis, wherever peritoneal infection was apparent. They had no deaths in over 200 cases, whereas their previous fatality was 2·7%. No ill effects were observed and complications were few. More recently Griswold and Antoncic [12] have used intraperitoneal sulphanilamide in perforated peptic ulcer. They had previously observed a close relationship between the mortality and the presence of streptococci in the peritoneal exudate. Judging from the few cases so far treated the fatality seems to have been lowered. Gardiner [13] has been struck by the advantages of local implanation of sulphapyridine in peritonitis from various causes, particularly in its relation to wound healing. He is one of the few to employ sulphapyridine in this way but has noted no irritant effects. However he used drainage in nearly all his cases. In the one case coming to autopsy there was no sulphapyridine apparent to the naked eye, but it would have been difficult to detect even if present.

As well as in the obvious sphere of established peritonitis, sulphonamides might well be employed where the peritoneal cavity has been soiled either by trauma or at operation. In resection or anastomosis of gut, even by so-called aseptic methods, potential soiling occurs, particularly in dealing with the large intestine. Hudson and his colleagues [14] assume that the high mortality associated with resection for intestinal obstruction is due mainly to peritonitis following contamination at operation. This supposition may have its fallacies, but recovery followed in both cases where sulphanilamide was employed locally. One patient died from another cause five weeks later, when it was found that the anastomosis was healthy and no adhesions were present. In the second case the value of local sulphanilamide was difficult to estimate since sulphapyridine was also given intramuscularly. In rabbits they found that local sulphanilamide gave a remarkable protection after deliberate contamination of the peritoneal cavity with intestinal contents, although its value in preventing peritoneal infection after resection was not striking. Technical difficulties are serious in an animal of this size, and an imperfect suture-line was probably responsible for the equivocal results obtained, resulting in delayed leakage at a time when the sulphanilamide had been absorbed. This is borne out by clinical experience, where in large-bowel anastomosis and resection for acute intestinal obstruction the technical difficulties in forming

5. Corbett, C. and Bazett, H. *Spec. Rep. Ser. med. Res. Coun. Lond.*, No. 53, 1920, p. 18.
6. Viteles, M. S. Industrial Psychology, New York, 1932.
7. Benedict, F. G. and Benedict, C. G. Mental Effort in Relation to Gaseous Exchange, Heart Rate and Mechanics of Respiration, Washington, 1933.
8. Newell, E. T. *Surg. Gynec. Obstet.* 1939, **68**, 760.
9. Throckmorton, T. D. *Proc. Mayo Clin.* 1941, **16**, 423.
10. Mueller, R. S. *J. Amer. med. Ass.* 1941, **116**, 329.
11. Thompson, J. E., Brabson, J. A. and Walker, J. M. *Surg. Gynec Obstet.* 1941, **72**, 722.
12. Griswold, R. A. and Antoncic, R. F. *Ann. Surg.* 1941, **113**, 791.
13. Gardiner, R. H. *Lancet*, 1942, i, 195.
14. Hudson, R. V., Selbie, F. R. and Smith, R. *Ibid*, 1941, i, 438.

a perfect suture-line are very real, and the cause of the peritoneal infection which may follow is more likely to be late leakage than operative contamination. In Gardiner's [13] case of strangulated hernia with resection, the patient's condition began to deteriorate at a period when the suture-line would tend to be weakest, and at autopsy generalised plastic peritonitis was found, as in the cases described by Hudson, although sulphapyridine had been implanted. The anastomosis appeared to be sound.

The mode of action of sulphonamides in the peritoneal cavity must largely govern the technique employed. It is now agreed that sulphonamides exert their bactericidal effect by virtue of their local concentration. That this is so in the peritoneal cavity is supported by Mueller's [10] observation that although absorption was rapid the average blood concentration rose only to 7 mg. per 100 c.cm., in spite of the improved clinical results. Most surgeons insert 10–15 g. of the powder, implanting part in the tissues of the abdominal wall. In those cases which are drained the concentration of sulphanilamide both locally and in the blood-stream falls rapidly, and with increasing experience of this technique drainage will no doubt become less called for. It is also important to keep up an effective concentration of sulphanilamide in the blood by other routes.

IMMUNISATION WITH LIVING ORGANISMS AGAINST PNEUMONIC PLAGUE

THE last pandemic of plague began probably in the province of Yunnan in China and reached Canton in 1894. Since then plague has become endemic in many widely scattered countries not only in towns but in certain rural areas, more especially in Manchuria, California, South Africa and possibly in the Nilgiris in Southern India. In those countries sylvatic plague is carried on not as a human or rat infection but as an enzootic of wild rodents: on occasions it becomes epizootic although the exact reasons for the occurrence of epizootics are unknown. They are probably connected with periodic cyclical variations in the rodent and flea populations. Fluctuations in other animal populations may also play a part in the appearance of epizootics. Wheeler, Douglas and Evans,[1] for instance, have found that sticktight fleas *Echidnophaga gallinacea* caught on the burrowing owl were infected with plague. The burrowing owl, *Speotyto cunicularia*, lives in close association with ground squirrels in California, while sticktight fleas are parasites not only of chickens and other domestic fowls but of rats, wild rodents, coyotes and various predatory birds. When epizootics are present among rodents epidemics among human beings not infrequently follow. In some of these epidemics the cases are predominantly pneumonic, as in the great Manchurian outbreak of 1910–11 when more than 50,000 cases of pneumonic plague are said to have occurred. In South Africa the incidence of pneumonic cases has been fairly high in many of the mixed bubonic-pneumonic outbreaks that have been reported since plague was first recorded in that country in 1899. Gale [2] has recently described an outbreak of pneumonic plague in a native reserve, Moroken, in the Kalahari a hundred miles north-west of Vryburg. The outbreak in man was apparently preceded by a severe epizootic among veld rodents, especially multimammate mice and springhares. Thirty-six deaths and one recovery from pneumonic plague are recorded. Recovery is very rare and this one is of particular interest because the patient had been vaccinated 5–6 days before she came in contact with a case of pneumonic plague by a vaccine prepared by Grasset [3] containing attenuated living plague bacilli. The incubation period was not prolonged by the injection of vaccine since it was about 3–4 days, the average for the series. The living vaccine prepared at the South African Institute of Medical Research contains both the EV strain from the Pasteur Institute of Antananarivo in Madagascar which has been used by Girard and Robic [4] and the Tjiwidej strain from the Bandoeng Pasteur Institute which has been employed on a large scale in Java by Otten.[5] Both strains are highly antigenic but have undergone spontaneous attenuation. Rodents such as guineapigs and wild rats can tolerate 20,000 million living organisms of these attenuated strains injected subcutaneously although white mice and rats and the multimammate mouse die after smaller doses as a result of their susceptibility to the toxins liberated by the bacilli. Curiously enough the degree of protection attained in guineapigs is higher with the EVs train than with the Tjiwidej strain though for unknown reasons the reverse is true in wild rats. No evidence has been found that either of the strains ever reverts to its original virulence. For human immunisation a dose of 1000 million living organisms is injected, the material having been kept in the ice-chest for 5–15 days. Only very rarely is there any rise in temperature after injection of the vaccine while the local reaction is limited to a moderate swelling at the site of inoculation accompanied by some tenderness. In relation to the Moroken outbreak of pneumonic plague 1000 people were vaccinated without any serious reaction. As in so many field experiments however the exact value of the vaccine is difficult to assess since many vaccinated people were not afterwards exposed to any real risk. Six people who had been vaccinated contracted pneumonic plague and five died but in all these five contact with a known case of pneumonic plague had occurred 0–6 days before immunisation. The girl who recovered was the only one exposed to infection after immunisation. Eighty-four other people were vaccinated either within seven days of contact or before contact and as none of them developed plague their escape may have been the result of the immunisation. The method is thus without danger and may well prove on more extensive investigation to be of considerable value in the field.

1. Wheeler, C. M., Douglas, J. R. and Evans, F. C. *Science*, 1941, **94**, 560.
2. Gale, G. W. *Sth Afr. med. J.* 1941, **15**, 369.
3. Grasset, E. *Ibid*, p. 373.
4. Girard, G. and Robic, J. *Bull. Off. int. Hyg. publ.* 1936, **28**, 1078.
5. Otten, L. *Ind. J. med. Res.* 1936, **24**, 73.

Sir JOHN HEBB, the first director-general of the EMS, died on Feb. 15, at Ronkswood Hospital, Worcester, to which he had lately been appointed medical superintendent. Hebb became director-general of medical services to the Ministry of Pensions in 1933, and five years later he was seconded to the Ministry of Health to organise the emergency services there. He had a fine record both of war service and of general practice, and he devoted himself with the utmost enthusiasm to the new problems of civilian safety. But his health failed and his services were recognised by the conferment of a knighthood before his formal retirement from both these posts at the end of last August. He was in his 64th year.

Dr. WALTER HAWARD has been appointed director-general of medical services to the Ministry of Pensions in place of the late Dr. Herbert Lightstone.

MEDICAL TREATMENT OF EVACUEES IN NORTHERN IRELAND.—The Ministry of Home Affairs ask that medical practitioners who may be called upon to prescribe medical treatment for people evacuated to the reception area should bear in mind that the full benefits of all the existing health and welfare services in the area are available to evacuees on the same basis as to normal residents; and that the return of any evacuee to an evacuation area for treatment should not be recommended unless the doctor is satisfied that the necessary treatment is not available in the reception area.

In England Now

A Running Commentary by Peripatetic Correspondents

THE upper part of the stable door flapped violently to and fro with each icy gust of wind as it howled round the draughty farm buildings. Inside, on the frozen ground, there was the usual assortment of things to be seen in any farm outhouse—pitchforks, straw, sacking, a strawberry net, paint pots, part of an iron bedstead, a heap of swedes and an abandoned hen-coop. From nails in the rafters hung several sides of meat and a couple of superannuated outer covers, while on one of the walls an old harness suggested the more leisurely days which this building had once enjoyed. I protested mildly to the sergeant but was too cold after my journey to do anything but accept the situation. Other doctors had done coroner's post-mortems here before and one had even confessed to finding the barnyard surroundings restful after a hectic morning in the hospital. The sergeant murmured something to the effect that we could have had the byre had we preferred it, but it was less sheltered than the stable and wasn't so well lit! In one of the disused stalls lay a worthy collection of salvaged paper; in the other a battered body on a couple of packing-cases. My first concern was to differentiate rigor mortis from the generalised frozen state. Meanwhile the instruments had been spread out on an inverted pig trough and the village constable, with that courtesy which is universal in members of the police force, had gone in search of "nice hot water." They had thoughtfully provided disinfectant and towels and had even attempted to carry light on a flex from the nearest point, but the current was too weak. The only thing to do was to work with both stable doors fully open and to tolerate the arctic draught. The water arrived in a none too clean pig bucket. An abandoned watering-can would do fine to wash down the body, I was told. Giving the corpse a look of defiance, and with an admiring thought for the Spartan qualities of my predecessors, I reluctantly pulled off overcoat, jacket and shoes and stepped into the frozen spaciousness of the white wellingtons. Adhering strictly to ritual, I donned the thin damp shroud-like gown provided for my protection and welcomed the embrace of the leather apron, frigid though it was. Warming my gloved hands in the diluted pig swill I proceeded to cut through the frozen tissues, marvelling at the way in which parochialism is allowed to obstruct the course of Scientific Medicine. In spite of the open doors it was too dark in this gale-swept outhouse to see the cut surface of the organs, and as one's mind and limbs were too numbed with cold to think clearly it was decided to eviscerate the poor fellow and examine his organs under more favourable circumstances in the laboratory. With the aid of the constable's torch we made a cursory examination of the external injuries as well as circumstances permitted. Concern was expressed at the possibility of confusing our merchandise with that of the legitimate butcher who had so kindly lent the premises for this afternoon's necropsy. A minor scare was caused when a hitherto silent spectator protested indelicately through one of the many gaps in the rafters and almost lost us the spleen. It turned out to be neither a bat nor an owl but a curious and obviously outraged Plymouth Rock. This proved to be medico-legally a difficult case and the autopsy was of course not well carried out.

I am told it was good Queen Bess who ordained that we must make our examinations under such unfavourable circumstances, for the necessary legislation is not yet approved whereby bodies can be moved out of a parish to the nearest pathological centre for autopsy. Perhaps the great queen's ministers thought it salutary for us to spend our afternoons as far as possible in country surroundings away from laboratories. It is possible, of course, that when the parish regulations were formulated the Tudors had little thought for pathologists and casualties resulting from excessive usage of mechanically propelled road vehicles. They certainly could have no notion of the advantages of having a bacteriological laboratory in proximity to the post-mortem room for rapid diagnosis, or of the need for a microscope when searching for fat-embolism.

I have recently performed autopsies in several institutions which boasted a post-mortem room, and found them without exception to have no form of heating, and most of them had no running water. Post-mortem rooms are mostly to be found behind hospital laundries, boiler houses, refuge dumps and slag heaps, while if they are the particular pride of the municipality they have a peculiar predilection for abattoirs and corporation yards, so that the pathologist is at least on nodding, if not on thirst-quenching terms with dustmen, slaughtermen and knackers. One post-mortem room invariably has half an inch of water covering the floor, another is flooded out for days on end. Yet another boasts a permanent blackout, a flickering gas lamp and a door without a latch; on several occasions sheep have nosed their way in and taken fright at what they have seen.

Some distinction should be made between the corpse and the pathologist. At present the latter must wait on the former, although the corpse, which we are led to believe is likely to have much time on its hands, could help the pathologist enormously by taking the initiative and seeking his services in the hospital post-mortem room. Moreover, it may be desirable to keep the corpse cool until the time for autopsy arrives, but the pathologist does not share this tendency to decompose. On the contrary, with running water, both hot and cold, the chill off the corpse, a draught-proof room, and one of the many satisfactory forms of occasional heating the pathologist can work happily and with profit to all. Is it too much to hope that reformers who now so zealously work to improve the service of medicine will remember the plight of the parish-pump pathologist and recommend improvements without delay? Possibly there are not many areas remaining which adhere to the strict parochial outlook such as we have attempted to portray; I hope not.

The difficulties in the way of centralising autopsies to main hospitals are not insurmountable—this parish council will have to forgo an occasional five-shilling parking fee, that borough council will have to pay for the transfer of the corpse to the centre while the hospital itself will have to educate its patrons to the fact that the traffic of corpses is not entirely autochthonous, and therefore not necessarily a reflection on the skill of the medical staff. The retort that long-wanted reforms must now wait till after the war is ill-advised in this instance. War-time is ideal for instituting reforms and local authorities are naturally desirous of furthering the cause of medicine.

Your correspondent is far from peripatetic at the moment, for he is confined to bed with an illness caused through working in a damp, draughty and unheated post-mortem room.

* * *

When we die and the account is totted up—5 for a cure, minus 50 for a kill, lesser marks for intermediate results—then, by and large and without boasting, on the professional page I think at any rate most of us will at least not be overdrawn. If, as it should be, prevention is generously rewarded, if the Great Audit goes into detail and gives so much, say, for each acarus or tænia destroyed or prevented, then one of the well-deserved multimillionaires of the future will undoubtedly be S. M. Lambert, author of "A Yankee Doctor in Paradise" (Boston: Little, Brown and Co., pp. 386). Dr. Lambert worked for the Rockefeller Foundation in that area of the Pacific, the fringe of which is now being invaded by a peril even more dangerous than *Necator americanus*, the hookworm which was his principal foe. He spent 20 years there, and this book, this Pacific delight, brazed tears and laughter, tells lovingly of them. Everyone going into the Colonial Medical Service ought to be made to read it and Lord Moyne should learn passages by heart. Naturally in a book dealing with hard campaigning against hookworm some of the humour is of that boyish and excretory kind that makes all the world akin, like the story of the lost world, Rennell Island, whose inhabitants stampeded in terror when they finally grasped from demonstration what the small tin boxes were for. The subject was as tabu for them as it is in our suburbs. (Often I wonder what the Highest Brows laugh at. Very irregular verbs and preterpluperfects? Or perhaps they don't laugh, or perhaps there are no HBs.) Sometimes in my life I have read books and then met the authors—disappointing. But the Lambert I met many years ago in Suva and on the Pacific, the child

of whose sweat, the Fiji medical school, I saw many times, and the Lambert I have been meeting again reading this book are the same. I should like to criticise this big-hearted and big-minded American with the same kindly discernment with which he deals with kings, governors, and cannibals, this man who has risked and done so much for the people of our Empire, but all I can say, and that very humbly is: as far as I know, here is Homo sapiens at his best. One golden thread running through the book is his brotherly affection for his disciples; yes, that is the word, for I have seen them. And I think the adjective is "wonderful," not in the worn sense, but more as David used it of Jonathan—"passing the love of women."

* * *

Having four hours to while away in one of our large cities I toured the bombed area, and meditated on the vagaries of blast that could suck out the windows, bring down the ceilings, demolish entire sides of walls and yet leave the electric light bulb intact on its dangling flex and the stag's head unharmed above the non-existent grate. Having gaped at a profusion of kippers, cakes and sausages in various shops, my attention was attracted by a Christian Science rest-room for the forces. The room was filled with flowers, armchairs, and copious writing materials; and Moses viewing the promised land could not have been more strongly attracted than I was. I hesitated to enter, not from sectarian scruples but lest the organisers, by the pricking in their thumbs, would detect me as inimical to their beliefs. I turned away, but those padded armchairs, those cunningly arranged reading-lamps proved too much and a couple of seconds later I was inside. Whatever part science plays, the welcome was certainly Christian. I was pressed to write to all my friends and relations at their expense, lured to the easiest chair and urged to read something. I was about to refuse this last offer, reflecting that "Aids to Diagnosis" would hardly be seemly, when I found I was being offered a copy of the *Christian Science Monitor*, a worthy American publication mainly remarkable for the astonishing profusion of its Swiss advertising. Lingerie shops, chocolate shops and hotels in Berne, Lucerne and where-have-you, urged the superiority of their wares and accommodation—I am still puzzled to know why, since Americans can hardly be flocking to Switzerland during the war. At this point my attention was painfully directed towards my hostess who, judging by the noise, was having a heart attack in her little office. I peered as far round the door as possible, but could only see the tips of her shoes. My first impulse was to offer assistance, but this was checked by the thought that she would probably bitterly resent any suggestion of medical aid. All the same the symptoms sounded alarming, and I compromised by moving nearer to her lair, determined that if the attack increased in violence or I heard the thud of a falling body nothing would stop me rushing in. For a long time all was quiet, and I was just being censured by the coroner when she swayed out of the office looking rather wan, but alive and on her feet. "Were you cold in that chair?" she asked so solicitously that I felt the blackest of impostors. "No, it's just that I've got a cold," I muttered hoarsely. Smiling tolerantly, she remarked that I had come to the right place to get rid of it. Perhaps I had; certainly the medical profession has never managed to get rid of one. Feeling however that I had tempted Providence sufficiently by weathering out her own attack with her I thanked her warmly and left.

* * *

For years I eschewed all books that did not touch on medicine. But there came a day when I had to abandon my work and take up blood-letting. I soon found the monotony almost intolerable. So I yielded to an old temptation and for nearly two years fairly wallowed in the books I had so long turned my back on. At first I shared the pleasures and hardships of the traveller; then, the early struggles of men to whom fortune had been kind. I passed on to men's ideas and thoughts in the essays of Lamb, Lucas (E. V.), Birrell and others. Something began to stir in me. Why should I always take what others gave? Why not try giving too? I found good friends to help me—Quiller-Couch on the Art of Writing; Raleigh on Writers and Writing; C. E. Montague's Writer's Notes on his Trade; Allbutt's Notes on the Writing of Scientific Papers; Somerset Maugham's Summing Up; and so on. On Raleigh's advice I took Hazlitt and read his essays with gusto. I stumbled on a trick of reading about someone I was interested in by someone who wrote well—Hazlitt by Leslie Stephen or by his daughter, Virginia Woolf (she wrote the better essay, I thought). Then came the big discovery. One day I casually turned over the pages of Julius Cæsar and found my attention held. I could read Shakespeare. Another author to my list. And what an author! I went through all the tragedies quickly and then read them slowly a second, third and fourth time. As with good music, further acquaintance ripened into friendship. My trusty guides, Hazlitt, Quiller-Couch, Raleigh and others were there again to help me, to show me where and how to look for the good things. And so the field grew ever bigger, until the time came for me to go back to my job—and to less time for reading. I had made some lifelong friends. I had also learnt how foolish I had been to deny myself the books that do not touch on medicine.

MEDICINE AND THE LAW

Overdose of Insulin

A RECENT inquest on a two-year-old child at a Hertfordshire hospital showed that a fatal overdose of insulin had been administered through a misunderstanding of the label on the bottle. The child, when admitted, was suffering from impetigo and scabies. Special treatment was prescribed—5 units of insulin followed by 10 grammes of glucose. A sister, who consulted with a nurse as to the dose, misread the label on the insulin bottle. It contained the figures "5 c.c. (40 units = 1 c.c.)." She read this as "5 c.c. = 40 units"; her explanation was that she had picked up the bottle between finger and thumb and had thereby obscured part of the label. A dose of 10 minims (the supposed equivalent of 5 units on this mistaken basis) was administered between 8 and 9 P.M. A subsequent message from the doctor directed a second injection of 10 units of insulin followed by 20 grammes of glucose. This was given soon after midnight, another nurse helping. Next morning, about 7.20, the mistake was discovered. It was reported to the night sister who said that the doctor would be seeing the child in a few minutes. The doctor paid a routine visit at about 8.10 A.M. The child had a fit at 11 A.M. and was then again seen by the doctor who ordered more glucose. There was another fit at 2 P.M. and death, occurring later when all remedial measures had failed, was found due to hypoglycæmia.

Recording a verdict of "death from misadventure," the coroner said it was clear that the dose administered to the child was about five times that which was ordered. The instructions had been given plainly; the mistake arose in following them out. The doctor stated in evidence that he was not informed of the mistake till 3 P.M.—at least seven hours after it was discovered; he thought the child had been abnormally affected by the dose he had ordered; had he known earlier, he said, the steps taken might have been more effective. The coroner expressed himself as not satisfied that a full and proper admission of the error had been made to the doctor. The nurse had said that, having reported the matter to the night sister, she had done all that was required of her under ordinary hospital practice.

Whether or no there was any absence of candour, incidents of this kind suggest that, at any rate in present war conditions when training is sometimes less thorough, there should be a revision of the relative responsibilities of hospital staffs or of the cryptic methods of labelling dangerous remedies.

Artificial Limbs for Injured Workmen

Last week, in Redpath Brown & Co. *v.* Hayes the Court of Appeal gave a ruling which, so far as it goes, may help the rehabilitation of victims of industrial accidents. In effect the injured workman is not to be expected to provide for an artificial limb out of his own pocket; if the employers invite him to submit to amputation in order to lessen his incapacity and thereby to lessen their own liability to pay weekly compensation, they must furnish him with the necessary surgical appliance. Hitherto there have been several sources from which help might come. The man's approved society might provide the artificial limb if its funds

permitted; his employers might pay for it, though they sometimes required him to bear half the cost; insurance companies, hospital contributory associations, charitable societies or public-assistance authorities might come to his aid. But these possibilities were hypothetical rather than definite. Amputation may be a proper step towards rehabilitation. The workman is often reluctant to undergo a surgical operation. There should be some certain prospect of the provision of essential appliances to encourage him.

In the case before the Court of Appeal the man's foot had been badly crushed four years ago. A large part of the bone was removed after the accident. He can now walk two miles slowly with the aid of a stick and can stand without crutches, but he suffers considerable pain. The question whether a further surgical operation is proper is one of fact for the arbitrator under the act to decide. In the present case there was, as may often happen, a divergence of expert opinion. The court was told that one "eminent surgeon" had expressed the view in February, 1939, that the foot should have been amputated after the accident; last May he saw the patient again and advised that amputation would be wise. On the other hand another "eminent surgeon," whom the workman himself consulted last September, thought that, in the absence of any further deterioration of the condition of the foot, amputation would be a "high-handed" course. The workman having refused to undergo this surgical operation, his employers asked for the review and termination of the weekly payments on the ground that the refusal was unreasonable. While the Workmen's Compensation Act nowhere positively obliges workmen to undergo operations, a series of decisions in 1909 established that anyone who refuses when no risk is involved and when cure is probable will thereafter be deemed to be suffering no longer from the effects of the accident but from his own refusal. In the case of Hayes the county court judge thought that he had refused unreasonably; he therefore reduced the weekly payments from 30*s.* to 20*s.* The Court of Appeal says that this was wrong. If two "eminent surgeons" give diametrically opposite advice with regard to a major operation, said the Master of the Rolls, it is impossible to call the workman unreasonable because he accepts the view of one rather than the other. There is no legal novelty in this dictum. It is well settled that it is not unreasonable for a man to follow the advice of his own medical attendant. In Gracie *v.* Clyde Spinning Co. (1915) a Scottish court declared that, where the workman's own doctor advised against operation, his refusal could never (save in very special circumstances) be the proximate cause of his incapacity. What was new in the Hayes case was the insistence that the employers ought to furnish and maintain an artificial limb if they ask the workman to have his foot amputated. The employers made a belated offer to furnish one when the point was taken in the Court of Appeal. The Master of the Rolls stated that, if this operation had been performed, the workman would need an artificial limb for the rest of his life. It was not a question whether the proposed operation was reasonable or likely to succeed, but whether the workman was unreasonable in refusing to undergo it. If he was invited to have his foot removed, but was given no security for obtaining the necessary limb, he could not possibly be said to be acting unreasonably in refusing the operation. Thus the Court of Appeal puts upon the employers a new duty whereof the cost will doubtless be adjusted in the usual arrangements for insuring their risks. The decision does not mean that all injured workmen will get artificial limbs at their employers' or the tax-payers' expense. We still await the overdue reforms of our statutory system of workmen's compensation which will somehow link it (as has been achieved in other countries) to a coördinated plan of restoring the incapacitated worker to such employment as he can perform. But, within its limited range, the judges' new ruling is a welcome step in the desired direction.

MEDICO-LEGAL SOCIETY.—A meeting of this society will be held at 26, Portland Place, London, W.1, on Thursday, Feb. 26, at 5 P.M., when Dr. Eric Gardner will read a paper on sudden death in water and from choking and suicidal hanging.

Letters to the Editor

YOUNG LONDONERS IN WAR

SIR,—In 1931 I was permitted to publish some comparisons between the average height and weight of an unselected consecutive series of sixteen year old London boys and girls, 200 of each, presenting themselves for employment in the Post Office, with a similar series of sixteen year old boys and girls examined 25 years before. This showed that the boys of 1931 weighed, upon an average, 16 lb. more and were 1½ in. taller than their predecessors; and that the girls weighed an average of 9 lb. more and were 1 in. taller than their predecessors. These figures could not be taken in themselves as an index of all that is embraced in the vague term "nutrition," but they seemed to suggest—at any rate among the London youth from which the Post Office draws most of its young employees—a considerable average increase in general growth and stature.

A similar comparison may be of interest between the fourteen year old London boys and girls, examined for employment as boy messengers and girl probationers in 1938—the last complete year before the war—and those examined for similar employment in 1941, after 15 months of war. Most of these boys and girls have been educated at elementary council schools and most of those examined in 1941 had been in London throughout the war, had known the air-raids of 1940 and early 1941, and had of course been subjected to the common rationing of foodstuffs. The tables below show the average height and weight of 300 such boys and 200 such girls examined in 1938 and of 300 boys and 200 girls examined in 1941. In both series, heights and weights were measured in indoor clothes without shoes; and all those examined were between the ages of 14 and 14½.

	BOYS		GIRLS	
	Av. ht.	Av. wt.	Av. ht.	Av. wt.
1938	5 ft. 1½ in.	7 st. 6½ lb.	5 ft. 3 in.	7 st. 11½ lb.
1941	5 ft. 2½ in.	7 st. 9 lb.	5 ft. 3 in.	7 st. 12 lb.

In each group there were 46 boys weighing 9 st. or over. Out of the 300 boys examined in 1938, there were 20 rejections, chiefly for defects of vision; among the 300 examined in 1941 there were only 10 rejections, defects of vision being again the chief cause. Among the 200 girls examined in 1938 there were 16 rejections, 7 being for visual defects; out of 200 examined in 1941, there were 21 rejections, 10 being for visual defects. In both series at this particular age the girls, on an average, were slightly taller and slightly heavier than the boys. But in spite of war conditions the girl entrants of 1941 were, on an average, as tall and weighed as much as those of 1938, while of the boys, the 1941 entrants were on an average an inch taller and weighed 2½ lb. more than their predecessors.

H. H. BASHFORD,
G.P.O., E.C.1. Chief Medical Officer of the Post Office.

THE FUTURE STAFFING OF HOSPITALS

SIR,—Professor Platt's article will no doubt prompt criticism. He aims at multiplication of specialists and, while he states that "men of outstanding ability form a small élite in any nation," he wishes to rid the specialist services of men who display a high standard of mediocrity. The intellectual superiority of the specialists in his scheme is therefore impossible of attainment. There is another factor which he has overlooked. After 25 years of expensive education and a year or so as a houseman with pocket-money for salary, the poorer members of the profession will not be stimulated to apply for positions as assistants, registrars, &c. Many (and the number will grow) will be precluded financially, others will wish to marry—a reasonable reaction to the way God made us—and will thus be unable to afford minor jobs at minor salaries, especially with the prospect of not being re-employed after 5 years.

He visualises the small town clinic and in his first paragraph allows for general practitioner hospitals. Does he feel that the entire nation will wish to go to hospital after the war? Before we decide to increase the number of specialists let us consider the requirements of the nation. The nation must have fit men. The man who suffers from a minor disability and is normally

attended by the general practitioner is the first consideration. He must have the best advice not only to enable him to recover from his illness but to enable him to keep fit, and this will come from the general practitioners, who must be more numerous and of a higher standard. The value to the nation of the type of case treated in hospital is reflected by the instructions to medical recruitment boards. Men who have been cured of duodenal ulcer for years are rejected as useless. Balanced diabetics, and those cured of tubercle in any form for years, are all declared to be useless. Many others turned out of hospital as fit and well are rejected. Thus the patients who fill our hospital beds are regarded as potential liabilities to the state, and the percentage of them returned fit for the Services is far less than the specialist imagines.

Wherein then lies the case for the multiplication of the specialist, who must be of a higher standing, when such a procedure must lead to deterioration in type and numbers of the general practitioner class? The general practitioners must be the prime consideration of the nation. They must be better qualified for their work, their numbers must be increased, and they must be well paid. If the head of the small town clinic is to receive the princely salary of £600–£800 a year, plus a limited income from private work, what income could the general practitioner demand, especially when it is intended, even in these days of democracy merging into socialism, to make the head of the clinic the big noise of the district and create him the leader of the profession in its civic and cultural advancement? But there is little need to worry. Before the war, changes were taking place in the profession which will continue. Better qualified men were going into general practice, partnerships in which members could also follow a special line were growing in numbers and size, and the single-handed practitioner was being stamped out. With this change and with the impecunious state of the nation after the war there will be little or no consulting work for the second-rate specialist. Was this position not being created before the war? How many second-rate Harley Street specialists would have been glad of the opportunity of a hospital job at £600 a year with restricted private practice? How many "carpet-bag" surgeons would have welcomed this?

One cannot legislate for postwar hospital personnel and at the same time exclude the general practitioner. What then is the solution? There are already too many specialists, too many hospitals as specialist centres. The hospitals are too small in general and too urban in position. Let us have a regional specialist service. One regional hospital, with extra provision for the great cities and thickly populated areas. Distance will be no bar. After the war we shall have hundreds of landing grounds, tens of thousands of pilots and aeroplanes. We have an adequate road and railway system in addition. These hospitals should be the teaching centres with directors of clinics at £5000 a year, whole-time and on the Civil Service scale of pension dating from the commencement of their medical education. In the closely populated areas, both small and large, should be hospitals staffed by general practitioners and supervised by the regional hospital. These men would do the minor specialist work which at present wastes the time of the best of our consultants. The more complicated work of investigation and treatment would be done by the "small élite of men of outstanding ability" at the regional hospitals. All classes would necessarily go to hospital in emergency, for we should see the end of the incompetent and wasteful nursing-home system. Lastly, let us not forget that the Ministry of Health has a controlling hand in the health services, in general practice, and now in the hospital system by way of the EMS. The EMS may change its name after the war but governmental control will gradually become greater. It is therefore essential that the planning committees should find first-class advocates to extract information from articles like Professor Platt's and also from the criticisms.

Could a scheme like this be paid for? Industry earned £7000 million a year before the war; £70 million a year was paid in industrial insurance; the hospitals cost £60 million a year. England will rise again and so will these figures. Therein lies a solution.

Reading. S. C. ALCOCK.

HUSBANDING OF LIVER EXTRACTS

SIR,—Unlike Dr. Dyke, we regard your leader of Jan. 24 (p. 110) as a reasonable statement of the present position. It is not clear why Dr. Dyke selects one ampoule of 2 c.cm. as a "small dose" since ampoules of liver extracts are put up in sizes from 1 to 10 c.cm., and your leader states quite clearly that there may be as much as a five-times difference between equal doses of different clinically active brands.

We use mostly "standard" liver extracts of which the unit dose can be taken as 4 c.cm.; like Dr. Dyke we only use batches that have actually been clinically tested in this department and of whose activity we are satisfied. In 12 years some 1500 cases have been seen in this clinic; of those treated exclusively with intramuscular liver extracts, the majority require 4 c.cm. every 2–6 *weeks*; those who can maintain normal blood-counts on less frequent doses form a fortunate minority. Most of our patients are drawn from the insured and "lower income" groups; there seems to be some connexion between the diet taken by these patients and the maintenance dose required. This point was dealt with by Seymour, Heinle and Miller, and we have noted that, under present conditions of dietary restriction, we have had to increase the maintenance doses of liver extract in many of our less well-off patients, especially women.

With regard to depot treatment, our experience agrees with that of the American workers you quote—it is uneconomical. The concentrated extracts, costing 2–4 times as much as the standard extracts, give less than 2–4 times the length of maintenance from them; a double dose of a given extract is unlikely to maintain the patient twice as long as the single unit dose.

A reliable system of accurately estimating the anti-anæmic potency of liver extracts is certainly needed, but we think it will have to wait until a suitable laboratory method is found. Patients are so variable; patients with the same blood-count may be quite different clinically, have differently cellular marrow, and most of them respond differently to equal doses of the same liver extract. The only way of overcoming these difficulties is to test the same extract on a sufficiently large number of patients, to make the results amenable to statistical technique; the 13–14 patients a year seen even in a good-sized clinic like Dr. Dyke's do not go very far for this sort of thing even if we assume that none were in spontaneous remissions or otherwise debarred for clinical test purposes (cp. Wilkinson, *Brit. med. J.* 1932, i, 325); there are so many batches of liver extract to be tested that we simply cannot afford to use one batch alone on the 10 or more patients that would be needed to make the resulting figures useful for the derivation of formulæ or other mathematical limits. It is a very dangerous and unreliable practice to attempt to give an opinion on the anti-anæmic potency of a liver extract from the results of one patient's response. We usually employ at least 3 suitable patients for each batch of liver extract to be tested—thus allowing us to give a reasonable qualitative opinion on about 40 different batches of anti-anæmic substances per year; on the same basis Dr. Dyke would not be able to test more than 4 or 5 batches per year according to the suitability of his patients.

Our criteria for anti-anæmic potency have been rigidly laid down (cp. Wilkinson, loc. cit.), but in addition to the reticulocyte response and subsequent rise in red-cell count mentioned by Dr. Dyke it is extremely important that the patients should be under careful observation and control in hospital, so that there is a preliminary control period of at least a week during which no treatment is given to make sure that (1) the patient is not in a spontaneous remission, which would invalidate any results obtained, (2) the case is one of *uncomplicated pernicious anæmia*, (3) during the treatment no other anti-anæmic therapy is given, and (4) a careful check can be made on the blood-counts.

It will be obvious that if the liver extract being tested has a potency greater or less than that expected, the standard dosage will be wrong and further cases will also be required to standardise it. If all these criteria are not fulfilled, then statements as to the clinical values of anti-anæmic preparations and comparisons between different preparations are useless.

All this may be summed up by saying that the clinical

anti-anæmic potency of a liver extract can only be determined under rigidly controlled conditions, in pernicious anæmia clinics sufficiently large to have enough suitable cases for test purposes; at least 3 test patients are required for a qualitative opinion and many more if a quantitative expression is attempted. We believe that more than ever during war-time adequate treatment should be given to these patients with pernicious anæmia, and that the depot method is neither the best nor the most economical one.

One other point comes from Dr. Dyke's letter—we do not allow a patient to go for longer than 3–6 months before re-examining the blood; even if the dose seems to have been stabilised for each patient, the requirements vary from time to time, especially during infections and other incidental illnesses.

JOHN F. WILKINSON.
Manchester. M. C. G. ISRAËLS.

SCABIES

SIR,—No apology is needed for a return to the problem of scabies, but the high proportion of scabies among patients sent up to a recent outpatient session for diagnosis prompts this letter.

In the Scabies Order of 1941, local authorities have had powers given to them to enforce treatment of scabetics and contacts. The order also seems to imply provision of adequate centres for treatment. Success in the eradication of this disease will depend on the energy with which local authorities use their powers. The present wide distribution and severe incidence of scabies was foreseen a year or more before the war. At that time the control of scabies in the civilian population was already a problem, and under war conditions it has in some areas become out of control. The following are some of the reasons for this uncontrolled spread, and the steps proposed to remedy these difficulties. Some of the measures proposed have, I understand, already been put into effect by some local authorities.

1. The diagnosis of scabies is easy to make in most cases, but may be difficult in some. During the last war and for the following ten years, most practitioners had become expert in the diagnosis of the disease, but during the period when scabies was rare many practitioners were not sufficiently familiar with the signs of the disease.

A memorandum detailing the signs, symptoms and treatment of scabies, and reviewing the arrangements made for treatment in centres and for the disinfection of clothing, should be circularised to practitioners, school doctors, school nurses and district visitors.

2. Early scabies may give rise to little inconvenience, and a patient may not complain. He may infect other members of the family while in this quiescent stage.

Short film talks and public announcements in newspapers on the prevalence of and symptoms of scabies, pointing out the long illness which may follow, could be made. The rapid cure which can be obtained should be emphasised.

3. Treatment with ointments or lotions, given at hospital with written or oral instructions, is often not sufficiently comprehended, and as a result is frequently ineffective.

The successful treatment depends on the opening of the runs and vesicles containing the mite and subsequent thorough application of the ointment or lotion prescribed. This is not at all easy for a layman to carry out, and should be done for each patient by a trained assistant.

4. The performance of bathing, scrubbing and inunction of ointments of all members of a family, where there are limited facilities, may be a matter of considerable practical difficulty. Again some of the male members of a family have frequently refused to attend hospital or to carry out treatment.

Centres equipped with facilities for bathing, and preferably for the disinfection of clothing, and staffed by personnel trained in the treatment of scabies should be available. These centres might be established at hospitals, and at first-aid posts and decontamination centres, which are not being used and are usually already staffed and mostly have arrangements for the supply of hot water. Where baths are not fitted tubs would be adequate. The staffs of such posts could be readily trained. Centres should be widely dispersed so that they can be attended by patients with a minimum loss of time. Those members of a family who refuse to attend for examination could be visited at their own homes and if possible treated there, either by the district nurse or, in the case of males, by medical students stationed in the vicinity. The application used should, in the majority of cases, be sulphur ointment for three days. Where the patient is unable or unwilling to give this time for treatment the shorter 36-hour method with benzyl benzoate or polysulphide ointment could be used, provided supplies are available.

Shorter methods of treatment.—There is no doubt that there have been good results with polysulphide ointment, hydrochloric acid and hypo, benzyl benzoate and derris root. Equally there is no doubt that there have been many failures with these methods, particularly at outpatients. These failures are only discovered when cases are followed up over a period of weeks. For example, derris root seemed to promise a form of treatment close to the ideal, because it was said to be effective without sterilisation of clothing. Of 15 cases treated at Guy's outpatients and followed up for several weeks, 9 were cured and remained so after a two-day treatment; in 6 cases the scabies relapsed; 4 cases developed a mild dermatitis of the limbs or genitals, but of these one had used the application every day for a week. The probability is that in the case of failures runs are not opened, and here I think the factor of intelligence comes in. Patients of low intelligence cannot understand directions given at outpatients, even if they are given as carefully as is practically possible, or else they may not bother to follow instructions.

The short methods of treatment are almost as likely as sulphur to produce a dermatitis. The possibility of using sulphur incorporated in one of the emulsifying bases might be explored, and if the cost is not prohibitive used on selected cases—e.g., people who are reluctant to undergo treatment because of the fear of spoiling clothing.

Devonshire Place, W.1. L. FORMAN.

RENAL GLYCOSURIA WITH HYPOGLYCÆMIA

SIR,—Major Ian Macpherson has drawn attention to a case of renal glycosuria coupled with hypoglycæmic attacks (*Lancet*, 1941, ii, 338). The following case has unusual features.

A bomb exploded within a few yards of an airman of 34 on Oct. 10, 1940. He felt no effects until next day when he had difficulty in breathing, retrosternal pain in the chest and pain in the epigastrium. There was much cough and dyspnœa and diminished air-entry into the left base but no hæmoptysis. He was admitted into hospital, diagnosed as "blast injury to lungs," and detained until Oct. 16 when he was sent on sick leave much improved. On Dec. 31 he reported sick and complained that he had lost a stone in weight, felt weak, and suffered from attacks of giddiness, "pins and needles" in his feet, headaches, and periods of collapse, and was unable to do anything for as long as 20 min. at a time. He was recorded as having been unconscious for 7 min. in one such attack. These attacks had started about the end of November, some 5 weeks after discharge from hospital. He was readmitted under Dr. Kenneth Perry. This time he had glycosuria and acetonuria, neither of which was present on his previous admission. Findings were:—

—	Fasting	After glucose		
		½ hr.	1 hr.	1½ hr.
Jan. 1941				
Blood-sugar (mg. per 100 c.cm.) ..	0·067	0·067	0·085	0·067
Sugar in urine ..	Trace	+	++	−
Aug. 1941				
Blood-sugar (mg. per 100 c.cm.) ..	..	0·1	0·081	0·077
Sugar in urine ..	..	Trace	+	++

In January, 1941, he stated his attacks were aborted and relieved by taking a knob of sugar by mouth, and he always carried sugar about with him.

At present (January, 1942) he has attacks about once every 2–3 weeks instead of every other day as he had at first. The attacks last 2–3 min. instead of 15–20 min. and he takes sugar which, he says, stops an attack in a few seconds. Exposure to cold brings on an attack. The commonest time for an attack is 8 P.M. or later. He rarely gets one during the day. His last main meal is at about 4.30 P.M. He complains of occasional pain in the chest, and dyspnœa on exertion not severe enough to interfere with his normal activities. Radiogram of chest on Oct. 21, 1941, was normal.

In a recent very cold spell he had two major attacks lasting 20 min., and several minor attacks, precipitated apparently

by going out into the cold, and a fasting blood-sugar estimation was found to be 0·049 mg. per 100 c.cm.

Among points of interest arising out of this case is the combination of glycosuria and hypoglycæmia. Are his hypoglycæmic attacks connected with the leak of sugar through the kidney? Is this, in fact, a case of renal glycosuria combined with hypoglycæmia? Has the blast injury any connexion with his symptoms? There was no history of glycosuria before the dates given, and his urine on enlistment in January, 1939, and on his first admission into hospital was recorded as being normal. His attacks did not begin until about 6 weeks after the exposure to blast. There seems to be little justification for postulating an underlying adenoma of the pancreas; glycosuria has not been described in such cases as far as I can discover. In any case the decrease of symptoms and comparative good health would hardly justify laparotomy. The possibility of blast injury to the pituitary region was considered.

I wish to thank Dr. Perry for his coöperation in this case.

J. RUBIE,
London, N.W.2. Medical Officer, R.A.F.V.R.

POSTURE DURING SLEEP

SIR,—Dr. Rigden suggests that Bjorkman discovered that the lung on which one lies gets more air than the lung on the upper side of the body and adds that Jacobaeus has set out Bjorkman's results in 1936. I had already noted this fact in your columns in 1919. In an article (*Lancet*, 1919, i, 697) I stated:

Great assistance in making a collapsed lung function properly is rendered by bending the body away from the injured side, as the patient lies on his back. This position causes a partial collapse of the sound lung by mechanical pressure of the ribs. Also, when possible, the patient should lie on the injured side when preparing for sleep.

In a letter (*Ibid*, 1926, i, 834) I wrote later:

I have often been questioned about this advice, doubt being cast on the idea that it is the lung on the side on which the patient is lying that is getting more air than the opposite lung. From careful observation I believe that this is really so. The side on which the patient lies sinks into the bed in a convex position and apparently the lung functions freely, the opposite or upper side is mechanically compressed by the position assumed, and expansion is restricted. I therefore always advise patients with an empyema to lie on the back, as described, or on the side where the rib has been resected, both from a drainage point of view and for expansion of the lung.

I gained my experience in the last war, working in 15 hospitals.

Wimpole Street, W.1. CORTLANDT MACMAHON.

WAR-TIME NURSERIES

SIR,—I cannot agree with Dr. Gilchrist and Dr. Menzies that "a day nursery, unless well staffed, is a menace" (*Lancet*, Feb. 7, p. 185). The children's own homes have been tried and found wanting. For thirty years we have been sending into them various kinds of domiciliary visitors to try and educate the ineducable, to make their homes safe for the children of democracy. Administrators in sociology admit, if they are honest, that these visits have been a failure and would prefer even an inadequately staffed war-time nursery to the average home as a means of rearing and nurturing the child of tender years. In Cardiff, the city council leapt at the opportunity of providing war-time nurseries: as a help in the war effort, yes, but even more as the thin end of the wedge towards permanent addition to the city's nursery school establishment. It already had a model nursery school and now has opened three war-time nurseries, with the hope of two more. I do not know whether your correspondents would regard our staffing as adequate. We have as peripatetic supervisor of all three an able woman, an ex-teacher, assisted by an equally peripatetic and equally able ex-health visitor. In addition to these two supervisory posts, the following staff is paid at each of the nurseries: a teacher in charge; a trained nursery nurse; probationers, usually girls between 16 and 18 years of age, who propose to take up nursing or teaching; and a cook.

This nucleus of paid staff is supplemented by a voluntary staff of women interested in the welfare of children; at each of the nurseries we shall be having at least four such helpers. No staffing difficulties are likely to occur, as we are flooded with applicants wishing to give voluntary help.

It is a joy to see the change to the good in the children brought to these nurseries even in the few short weeks since they opened. If there remains in their parents one tiny fragment of receptivity, it is likely to be stimulated most successfully not by being talked at, but by what they see at the nursery schools or war-time nurseries. It would be interesting to learn how many young Russian soldiers now fighting so fervently for their soil were reared in the equivalent of our war-time nurseries, and whether your correspondents would think that the staffing of these was adequate.

J. GREENWOOD WILSON.
Public Health Department, Cardiff.

SULPHONAMIDES AND ENTERIC FEVERS

SIR,—In contrast to Dr. Muller's case (*Lancet*, Jan. 24, p. 104) of paratyphoid B which responded well to sulphapyridine, I offer brief details of a case in which the drug, also given before the diagnosis was clear, had no effect on the temperature and a bad effect on the patient's general condition.

The illness began when the patient—a boy of 4, subject to eczema, asthma and prurigo—was in bed for a supposed attack of asthma. Large quantities of mucus were passed with some normal stools; temperature gradually rose to 103° F. by the end of the first week. On the 6th day the left ear ached and there was some redness of the drum and neck stiffness. Sulphapyridine given, 4·5 g. in 2½ days; ear signs passed off in 48 hours. During second week temperature swung between 98·4° F. and 103° F. On 8th day he had intense rectal pain, and passed blood and thin pus. Pus passed involuntarily for the next few days; one normal stool. Thereafter, watery motions with flecks of mucus and fæces mixed. On 11th day, white cells were 15,600 with neutrophils 64%. Sulphapyridine, 3 g. daily, begun again; caused vomiting and restlessness, and hampered the diagnosis of an erythematous rash appearing on 13th day. On 14th day, white cells 12,400. On 15th day report on stools came through: 7th day specimen, red cells +, pus cells +, mucus ++, no pathogenic organisms found; 11th day specimen, no red cells or pus, *Bacterium paratyphosum B* isolated. Widal, 15th day: *Bact. typhosum* and *Bact. paratyphosum A* no agglutination; *Bact. paratyphosum B*, agglutination at 1 in 2250. Sulphapyridine stopped the same day, and temperature became steady at 101° F. Patient lapsed into typhoid state; has vomited intermittently since.

In view of the deterioration in this patient's condition, which became critical during the second course of sulphapyridine, it seems inadvisable to give the drug to typhoid patients on the off chance that it will do good—at least under uncontrolled conditions from which no useful conclusions can be drawn.

Friar Gate, Derby. BARON RUSSELL.

MASS RADIOSCOPY IN FACTORIES

SIR,—Dr. Stephen Hall is to be congratulated on his survey of two factories, and one can appreciate that in the circumstances outlined by him mass radioscopy was the method of choice. The question arises whether its degree of accuracy and practicability compare favourably with those of other available methods. From my experience there is little doubt that it is an inexpensive means of detecting macroscopic lung lesions. But if we compare its accuracy with that obtained by mass radiography we must place it in the category of second best. Fellows and Ordway (*Trans. nat. Tuberc. Ass. N.Y.* 1937, **33**, 51), in a study of mass radioscopy in the examination of policy holders of the Metropolitan Life Assurance Company of America, compared their results with full-sized control films and found that in 2603 examinations 87% of pulmonary lesions were detected. In an analogous investigation of 3229 cases I have found that 94% of the interpretations coincided with those of the large film (*Proc. R. Soc. Med.* 1941, **34**, 595). In either study the value of the method is not disputed but its degree of error cannot be disregarded. In technically satisfactory miniature screen photography, however, Clark, Cordiner and I (*Brit. J. Radiol.* 1941, **14**, 54, 186) and Clark, Courtenay Gage and Poulssen (*Ibid*, p. 250), in

examinations of over 1000 cases, found that the discrepancies in the interpretations of the small and large films were certainly not above 1%.

Three other factors must be set against mass radioscopy—the possible physical risk to the examiner from long exposure, the absence of any permanent record, and the inevitable reliance on the varying experience of the individual examiner. By and large there can be no question that miniature screen photography is the most practical, reliable and economic single means of detecting macroscopic intrathoracic lesions in large groups of presumably healthy subjects, and while not wishing to minimise the value of mass radioscopy in the circumstances recorded by Dr. Hall I cannot but feel that it is a "second-best" and there is a risk that, merely on grounds of expediency, the best may be prevented from becoming a practical proposition.

The real problem, given the necessary apparatus, is to avoid victimisation of the worker. The Ministry of Labour, by including the tuberculous in the Government's scheme for the training and resettlement of disabled persons, has taken a step in the right direction. On the other hand, the practical support and coöperation of the whole of organised labour is necessary for success. As Dr. H. B. Morgan, physician to the T.U.C., has more than once stated, while he is in sympathy with the social potentialities of the method, he will not support anything which may lead to victimisation of the worker. In such circumstances a Government subsidy during the period of the patient's indisposition is an inevitable corollary to large-scale mass radiography and although undoubtedly costly should prove in the long run a fundamentally economic proposition.

Our Navy and Air Force are now beginning to appreciate the practicability of miniature screen photography for the examination of recruits. It is imperative that it should be extended to all the Services and to all young adolescents in war industry. Only in this way will its extension to the general population in peace-time be assured, so that postwar planning will provide periodic health examinations in which the miniature screen photograph will be as readily available and equally important to the examining doctor as a specimen of urine.

Wimpole Street, W.1. PHILIP ELLMAN.

BARBITURATE POISONING

SIR,—Dr. Fishman (*Lancet*, Feb. 15, p. 199) has reported that in a patient with barbiturate poisoning 3·2 c.cm. of 'Coramine' given intramuscularly and followed 15 min. later by a further 2 c.cm. had little effect. I should like to suggest that if coramine had been given in a larger dose intravenously instead of intramuscularly, the result would probably have been more satisfactory. As Dr. Mallinson (*Brit. med. J.* 1940, i, 123) has pointed out in discussing the management of respiratory depression during anæsthesia, coramine can almost be guaranteed to make a patient depressed by a barbiturate wake up enough to require restraint to prevent him from falling off the operating-table. It should however be given in sufficient dosage (5 c.cm. or more) and directly into the circulation.

Harley Street, W.1. A. W. SPENCE.

SUPERFLUOUS PREPOSITIONS

SIR,—I share Dr. Lawrence's objection to unnecessary prepositions—particularly to "beat up" with its inevitable association with the kitchen rather than the rough house, "Try out" is however a phrase used by that master of the English tongue, Archbishop Cranmer, as long ago as 1542.

London, W.1. W. LANGDON-BROWN.

SIR,—Aren't we all getting a little tired of these attempts to make English an unchangeable and therefore a dead language? Mr. Herbert has been proselytising in *Punch* for many years, and now Dr. Lawrence bursts forth (or does he just burst?) in your issue of Feb. 14. Please let us have a more generous rather than a more limited definition of a superfluous preposition. Prepositions, like adjectives, enrich meanings. A classical illustration with the adjective is the old one of two tramps sitting by the side of the road, one of them reading a piece of newspaper. 1st T.: See this? One man, one vote. 2nd T.: What does that mean? 1st T.: One bloody man, one bloody vote. 2nd T.: Ah! Well, why don't they say so? The preposition can be as effective an enricher of meaning as can the adjective. You have defended your "try out" with the aid of the Concise Oxford Dictionary. Mere common sense would have done as well. I would submit also that there is a considerable difference in meaning between Dr. Lawrence's examples, "check" and "check up," and "stand" and "stand for." After all, the written word is merely a method of recording thoughts; why should it not do the recording as accurately as possible? Before Dr. Lawrence finally makes up his mind that the English language should be placed in a strait-jacket, may I recommend him to read some of the American shilling-shockers now flooding the book-shops. He will there find, not some old-school-tie meiosis, but some beautiful (because accurately descriptive) language containing many prepositions and adjectives which few people other than himself would describe as superfluous.

E. R. H. SMITHARD.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS M.P.

IN ordinary times the announcement by Mr. Arthur Greenwood of the transfer of the Ministry of Health's statutory duties in regard to town and county planning to Lord Reith, now to be known as the minister of works and planning, would be of first-class interest. Up to the present Lord Reith's appointment has been an affirmation of good will but not of activity. He has not had power to get money from the Treasury for essential planning work and his small advisory staff have had to fill their time with other work. When Mr. Greenwood read his long and complicated statement General Knox was unkind enough to ask: "who wrote that essay?" But there will be a discussion later and the House will endeavour to pierce the defences of words and get through to the objective of action.

* * *

Sir E. Graham-Little courageously pursues his campaign for the national wheatmeal loaf and asked last week what was the effect of the buying up of bakeries by millers, and creating tied-houses for bread. Major Lloyd George had "no information."

* * *

A deputation of members of all parties was received by Mr. Attlee to discuss the investigation of complaints about conditions in the women's services. The Government seemed surprised that the House should consider it desirable to have women on an investigating committee, but it is hoped that they will relent and that the chairman of the committee will be a woman.

General conditions in the women's services are good but there are some black spots, some due to conscription which has brought in large numbers of women from all classes and occupations. It appears, for instance, that one volunteer woman is better than two "pressed" women even in health.

FROM THE PRESS GALLERY

Children in the Potteries

THE pottery industry—scheduled as a dangerous trade on account of both silicosis and lead poisoning—employs children under 16 as runners for the moulders. It is a blind-alley job, consisting of carrying the wet clay to the stoves, which the children must enter, and returning with the dried articles.

On Dec. 23 the Government issued a general emergency order extending the hours of employment of these young people from forty-seven to fifty-three per week, and Lord GAINFORD had much support when on Feb. 10 in the House of Lords he asked that the Government should give an undertaking that there should be no such increase. To impose such hours on children in a non-vital industry seemed to him absolutely unjustifiable, and he reminded the House that Lord Moyne had admitted that the medical inspectors of the Home Office had not been consulted with regard to the extension, and it was left to the employers and employed to see whether signs of undue fatigue appear. This was a departure

from the system that has grown up, which detracted from the authority of the factory inspectors, and gave no adequate safeguard to the children. He submitted that it was a cruel, retrograde and almost inhuman step which had not been found necessary in any vital industry in the country. Lord LISTOWEL said that during a war there is always a danger that the strength of children and adolescents may be overtaxed and the last report of the Chief Inspector of Factories had laid stress on the alarming increase in the number of industrial accidents involving young people—18% increase among boys and 11% among girls as compared with the preceding year. He asked that the Industrial Health Research Board should inquire into the working-hours of adolescent, as well as adults. Lord WEDGWOOD said that the real difficulty was that the trade union had not stood by the children, but he was glad to say the firm of Wedgwood did not propose to use this change in the rules or to increase the hours of work. Lord SNELL, while replying for the Government, found himself in personal agreement with much that had been said. No-one welcomed the employment of young people for periods beyond their strength but we were in a time of crisis when all of us had to work harder and longer. He offered the rather cold comfort that at least things were better than they were when children worked for 65 to 70 hours a week. Conditions in the pottery industry were exceptional, and the Minister of Labour had satisfied himself that it would be difficult for the industry if the 48 hours maximum was retained. The Government did not say that the order was desirable or even unobjectionable, but the Potteries had a heavy demand for munition workers and it was on the ground of acute need that the Government regretted they were unable to accept Lord Gainford's proposal.

Lord SAMUEL said that it was not lack of cogency in Lord Snell's speech which made his case unconvincing, but he had put forward no valid reason why this industry alone should ask the Government for an order of this kind. Lord Gainford said that though he believed in time of war the Upper House had never had a division he was reluctant to withdraw his motion, but he amended it to a gentle disapproval of the order. Lord WOLMER thought it a very strong measure to pass even this resolution, and Lord DONOUGHMORE pointed out that even if carried it would not abolish the operation of the order. Lord MOYNE, quite rightly, considered that even in this form the resolution would lead to the inference that the order was not justified and would be a vote of censure on the Government. But Lord ADDISON sensibly urged that surely they need not censure the whole Government because they did not want young people to work such long hours. If they accepted that doctrine they could not express an opinion on anything if it happened to be contrary to what a Government department had done. They did not want to defeat the Government, but to express their views on a human problem. On division the motion was lost by 17 to 20.

QUESTION TIME

The National Loaf

Sir E. GRAHAM-LITTLE asked the Parliamentary Secretary to the Ministry of Food whether he is aware that the practice by which millers buy up bakeries when they come upon the market and rent them to bakers who undertake to buy all their flour from that miller, militates against the adoption of the national wheatmeal loaf which local bakers are progressively unwilling or unable to supply on demand; and whether he will inquire into this matter?—Major G. LLOYD GEORGE replied: I have no information to support the view that the control of some bakeries by some millers has checked the production and sale of national wheatmeal bread.

Answering a further question Major LLOYD GEORGE said: Under the terms of the Bread (Control and Maximum Prices) Order, 1941, it is an offence to describe as national wheatmeal bread bread in the making of which ingredients other than national wheatmeal, oil or fat, water, salt, yeast, or improvers in the nature of yeast food, have been used. The policing of this order is carried out by the enforcement officers of the Ministry, but no prosecutions have been necessary since the order came into force in October last. No other instructions to bakers about the manufacture of national wheatmeal loaves have been given. There are some 27,000 licensed bread bakers in the United Kingdom, and to attempt to standardise their baking methods would be neither desirable nor practicable. One test of some hundreds of samples, directed primarily to ascertaining the quality of the national wheatmeal flour then in distribution, was carried out in the summer of 1941; but it has not been thought necessary to repeat this survey as more effective checks upon the quality of flour being manufactured have since been devised.

Advisers on Bread

Major LLOYD GEORGE informed Sir E. GRAHAM-LITTLE that Prof. J. C. Drummond, D.Sc., scientific adviser, and Mr. T. Moran, D.Sc., deputy scientific adviser, have advised the Minister of Food in regard to the fortification of white flour and the specification of wheatmeal. The Minister had also consulted Lord Horder, his personal adviser on medical aspects of food problems. Professor Drummond was appointed on Feb. 1, 1940, Dr. Moran on June 24, 1940, and Lord Horder on July 7, 1941. The advice given by officers of a Government department to their minister is confidential and is not published. There is a close contact between the Ministry and the Medical Research Council, the secretary of which is one of the members of the Scientific Food Committee appointed by the Lord Privy Seal in July, 1940, to advise upon problems of national food requirements.

Medical Staffs in Royal Ordnance Factories

Responsibility for the appointment of medical staffs employed at Royal Ordnance factories rests with the Ministry of Supply. Vacancies are advertised and candidates are also nominated by the local war emergency committee of the British Medical Association. In making selections the Ministry is advised where necessary by Ministry of Labour inspectors of factories and by independent medical practitioners. (Sir ANDREW DUNCAN replying to Mr. F. MESSER.)

Industrial Diseases among Miners

Mr. DAVID GRENFELL, replying to Mr. J. GRIFFITHS, said: The Workmen's Compensation statistics show for the coal-mining industry a decrease in the cases of nystagmus, beat hand and affections of the wrist and tendon sheath, and an increase in the cases of silicosis, beat knee, beat elbow and dermatitis. As regards dermatitis special inquiries are being made to find out why the certificates of disablement for this disease, which ten years previously were very few, reached a figure of 400 in 1940.—Mr. GRIFFITHS: If inquiries show that the increase in dermatitis is one to deficiency in diet will the necessary steps to deal with it be taken?—Mr. GRENFELL: Certainly.

Medical Inspection of Mines

Mr. F. MESSER asked Mr. GRENFELL if, in view of the greatly increased demand for tin and the possibility of tin-mines in this country being reopened, he was satisfied that the one medical inspector in the mines department now responsible for nearly 1,000,000 workers in mines and quarries was sufficient medical staff.—Mr. GRENFELL referred him to the reply given on Feb. 3 (*Lancet*, Feb. 14, p. 212).—Mr. MESSER: Notwithstanding that answer, is the Minister aware that silicosis is much more prevalent among tin-miners than coal-miners, and has he read the annual report for 1938 which shows that out of 1500 workers 20 died of silicosis, and does not that call for some action?—Mr. GRENFELL: It is well known that silicosis is prevalent in Cornish tin-mines, and certain preventive precautions were laid down by regulations to protect the workers against the incidence of this disease. I do not think that the men in Cornwall are lacking attention for want of medical knowledge on the subject.—Mr. MESSER: Is Mr. Grenfell satisfied that he has a sufficient inspectorate?—Mr. GRENFELL: I think it is sufficient for this purpose but the House knows that a very extensive investigation has been going on under the Research Board. The Lord President of the Council is in charge of it, and I am expecting a very comprehensive report from that body within a few weeks.

Classification of Recruits in 40-50 Age-group

In answer to a question the MINISTER OF LABOUR said: Such men are not at present being called up, and when they are, they will be posted only to static and sedentary duties. The existing classification is made on medical grounds, and while I think it unlikely that any modification need be made in the present medical code in order to enable men over 40 to be properly posted, I am in touch with my medical advisory committee on the whole subject.

Sir FRANCIS FREMANTLE: Does not X-ray examination of recruits eliminate people who are unfit for service but are not

ordinarily discovered as such by the recruiting boards?—Mr. E. BEVIN: I have been pursuing that subject, but it is really a question of equipment.—Sir F. FREMANTLE: Is it not the case that equipment is now coming forward in considerable quantity and can be supplied?—Mr. GRIFFITHS: Will the Minister in consulting with his medical officers bear in mind that a fairly large percentage of recruits are unfit because of industrial diseases or industrial accidents?—Mr. BEVIN: The present medical examination reveals a lot of what might be called preventable illness, that is illness which might be prevented by slight changes in the design of machinery and the form of occupations.

Efficiency of Medical Boards

Mr. G. C. TOUCHE asked the Minister of Labour in how many cases any action had been taken in regard to members of medical boards who had made serious mistakes in passing unfit men as grade I for the services.—Mr. BEVIN replied: The decision as to grading is taken by the medical board and not by an individual doctor. There have, however, been eight cases in which the appointments of chairman and members of medical boards were terminated on account of unsuitability or inefficiency: in some other cases in which appointments were not continued relative inefficiency or unsuitability was one of the reasons, but I could not give any precise figures under this head. I should add that the medical advisory committee, under the chairmanship of Lord Horder, which assists the department in making the arrangements for medical examination have given it as their opinion that the proportion of men who are passed by the boards as fit for service, and found later to be unfit, is small.

Mr. RHYS DAVIES asked the Secretary of State for War whether he had considered the number of members of the Army who had been discharged on medical grounds, in comparison with the number passed fit for service by the medical boards; and whether he was satisfied that those boards were functioning properly.—Sir EDWARD GRIGG, undersecretary for war, replied: In most cases where men have been discharged from the Army on medical grounds within a short time of enlistment it has been found that the effect of a disability noted and recorded by the medical board has been more severe under service conditions than was expected. There are other men who with the same or an even greater disability stand up perfectly well to service conditions and may subsequently be raised to a higher grade. I am not aware of any evidence to show that these boards are not in general functioning properly.

Service Men and Amputations

The normal procedure when a man has suffered amputation during service in the Armed Forces is to discharge him from hospital when his stump is soundly healed unless the special surgical needs of the case make this course undesirable. A short interval must elapse between the healing of the stump and the fitting of an artificial limb to enable the stump to settle down, and medical opinion is that generally it is better that during this period the man should not be in hospital. The man who has left hospital is kept under observation at a limb fitting centre of my ministry, and, in due course, is fitted with an artificial limb. Instructions will shortly be issued by the service departments which will ensure that any man who has suffered an amputation in service shall be retained in the Service and on Service pay and allowances until at least 28 days after he has been satisfactorily fitted with an artificial limb. (Sir WALTER WOMERSLEY replying to Sir JOSEPH NALL.)

Recruitment of Home Guard

Mr. RHYS DAVIES asked the Secretary of State for War whether any steps are taken to prevent mental deficients and other categories exempt from the Armed Forces from joining and retaining their connexion with the Home Guard.—Sir E. GRIGG replied: Volunteers for the Home Guard are registered at the local police-station in the first instance, and, if they are considered suitable for enrolment, they are interviewed by the unit commander. Home Guards can, of course, be of a lower medical standard than regular soldiers and I think that commanding officers can be relied upon to accept only such men as are fit to perform Home Guard duties.—Mr. DAVIES: Is the Minister aware that no method is in existence up to the present for finding out whether certain persons are mentally deficient or not; and is he aware that practically all the mentally deficients are properly registered, and that a scheme should be evolved whereby officers of the Home Guard could be put in touch with those registers?—Sir E. GRIGG.—All available information is obtained.

Hospital Waiting-lists

Mr. JAMES HOLLINS asked the Minister of Health whether his attention had been drawn to the long waiting-lists of voluntary hospitals and their unwillingness to transfer patients to emergency hospitals in the district in order that they might get treatment; if he was prepared to recommend that the emergency hospitals be made available for people desiring treatment.—Mr. E. BROWN replied: Where hospitals have been found to have unduly large waiting-lists their attention has been drawn to the facilities which exist for transferring patients to other hospitals under the Emergency Hospital Scheme.

Vacancies in Approved Schools

Mr. EDMUND HARVEY asked the Secretary of State for the Home Department whether he can give the latest figures of the numbers of children awaiting accommodation in approved schools; whether numbers of boys are still detained in prison owing to the shortage of remand homes; and what progress has been made in the provision of additional remand homes and additional approved schools.—Mr. HERBERT MORRISON replied: At the end of last year about 1300 boys and girls under 17 were awaiting vacancies in approved schools, but it must be remembered that it usually takes time to find for each case the appropriate school and there must, therefore, always be a substantial number waiting while arrangements are made for their reception into schools. The number waiting in prison was less than 20. No child under 14 can be detained in prison, and young persons between 14 and 17 cannot be so detained unless the court gives a certificate of unruliness or depravity. During the year nearly 600 additional places were provided in approved schools and about 450 in remand homes. Further plans are on foot, and although in war conditions the difficulties of finding premises and getting necessary work done are very great, it is hoped that a number of additional approved schools and remand homes may be opened during the next few months.—Mr. HARVEY: Would it be possible to lease premises or urge authorities to do so instead of merely acquiring by purchase?—Mr. MORRISON: I do not think that would be excluded from consideration.—Mr. KENNETH LINDSAY: Have they power to requisition?—Mr. MORRISON: I am not sure.—Mr. W. J. THORNE: Can anything be done to help local authorities to obtain more premises?—Mr. MORRISON: We give them all the help we can in that direction.

Exemption of Women Doctors

Captain G. S. ELLIOTON asked the Minister of Labour whether he would amend the Employment of Women (Control of Engagements) Order, 1942, made under the Defence Regulations 58A, to secure for doctors and dentists the exemption allowed to nurses, teachers, &c., and thus avoid unnecessary disturbance of the established customs of the medical profession in regard to vacant appointments, and the satisfactory arrangements now in operation by the Central Medical War Committee.—Mr. BEVIN replied: I am in consultation with the Minister of Health on this matter.

Infectious Disease in England and Wales

WEEK ENDED FEB. 7

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1113; whooping-cough, 1251; diphtheria, 920; paratyphoid, 9; typhoid, 11; measles (excluding rubella), 1611; pneumonia (primary or influenzal), 1366; puerperal pyrexia, 178; cerebrospinal fever, 181; poliomyelitis, 7; polio-encephalitis, 1; encephalitis lethargica, 6; dysentery, 115; ophthalmia neonatorum, 83. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on Feb. 4 was 1319, including scarlet fever, 125; diptheria, 219; measles, 50; whooping-cough, 524; enteritis, 51; chicken-pox, 44; erysipelas, 20; mumps, 29; poliomyelitis, 1; dysentery, 50; cerebrospinal fever, 24; puerperal sepsis, 16; enteric fevers, 5; german measles, 4; other diseases (non-infectious), 68; not yet diagnosed, 89.

Deaths.—In 126 great towns there were no deaths from enteric fevers, scarlet fever or measles, 7 (2) from whooping-cough, 29 (2) from diphtheria, 42 (6) from diarrhœa and enteritis under 2 years, and 84 (15) from influenza. The figures in parentheses are those for London itself.

Deaths from influenza were scattered over forty-seven great towns, Manchester reporting 4. There were 3 fatal cases of diphtheria at Liverpool.

The number of stillbirths notified during the week was 212 (corresponding to a rate of 38 per thousand total births), including 21 in London.

Obituary

HERBERT LIGHTSTONE

D.S.O., M.C., M.D. MCGILL

Dr. Herbert Lightstone, who died on Feb. 12 in his 64th year, was born in Canada. In 1898 he served in the Spanish American War with the American Red Cross in Cuba, and from 1899 to 1901 with the Canadian Field Artillery in the South African War. He qualified from Bishop's College, Montreal in 1901 and took his M.D. from McGill University nine years later. He held the posts of medical superintendent of the Women's Hospital, Montreal, and demonstrator of anatomy at Bishop's College before coming to this country where he interested himself in ear and throat work, holding a registrarship at the London Throat Hospital. In the Great War he served as medical officer, to the headquarters of the 4th Army, received the D.S.O. and M.C., and was six times mentioned in dispatches. In 1919 he joined the medical staff of the Ministry of Pensions, serving first as H.Q. inspector. He was promoted director of medical services in 1932 and deputy director-general a year later. When Sir John Hebb, whose death we record on another page, was seconded to the E.M.S. in 1938, Dr. Lightstone took his place as D.G.M.S. of the Ministry of Pensions. Of his work there his colleague, A. S., writes :—

"Herbert Lightstone had personality. His well-groomed, military figure, fine head, keen eyes, shrewd mouth, and quick forceful speech demanded attention. And he expected attention ; he had served in three wars, he knew the world of men and was conscious of his powers. He saw where he was going and how he meant to get there. Yet, blended with this vigorous independence, there was a need for companionship and support. He delighted in giving parties and was stimulated by an audience. He wanted his staff around him while he talked, discussed, directed and 'phoned with bewildering speed and in surprising sequence. Those who saw him at work learned to admire the clarity and subtlety of his mind, his foresight, and the rapid way he dug down to the roots of a problem. He had his moods of sheer impetuosity, especially if his audience was large, but when one saw him later, alone, he would agree to reconsider. His conduct of an interview was superb. He knew his man, and by voice, manner and phrase got just the atmosphere and usually the result he wanted. Lightstone was a man of wide sympathy, generously responsive to a call on his emotions and would go all out to help a friend or colleague in distress. With his staff he was direct, honest, and careful of their interests. You knew where you were with him ; if 'Lighty.' did not approve he said so, with emphasis and at once, and where he gave his trust he gave it in full measure. These qualities made him a memorable D.G."

Dr. Lightstone married in 1912, Doris Eva Joseph, who died in 1927. They had two daughters, who survive him.

KATHLEEN WILSON

M.B. LEEDS

Kathleen Wilson was always anxious to have a career at a time when this was unusual for a girl, but her home life predisposed her to an interest in affairs. She was the second daughter of Mr. Richard Wilson, a noted art collector, and she left the Leeds Girls High School early and travelled in the United States and Italy. For ten years she tried to escape from an unsatisfying social life. She did secretarial work at the Yorkshire Ladies Council of Education, worked in a bank and at real estate in Canada, and qualified as a sanitary inspector in Leeds. About 1914 she took her C.M.B. and this qualification enabled her to go with the Friends maternity unit to France soon after the outbreak of war. In 1916 she came home to work for matriculation and read medicine at Leeds where she graduated in 1921. She held several house-appointments at the General Infirmary before she began her seventeen years of general practice in the city, combined with part-time work at maternity and child-welfare centres under the corporation. In 1933 she also undertook the medical care of the women staff at Messrs. Lewis's, while as honorary medical officer to St. Christopher's Home for Infants and the Leeds Convalescent Society she gave unsparingly of her time and advice. For some years she had been anæsthetist to the Infirmary and the Dental School and Hospital. At the beginning of this war she became anæsthetist to one of the emergency hospitals and to a first-aid post, and regularly served on one of the medical boards for women recruits. She accompanied a party of children to Canada, and was on board ship with a second party bound for Australia when the evacuation scheme was stopped.

Dr. Wilson's varied activities and interests give a clue to her personality—all she did was leading up to medicine. She was an excellent dancer and swimmer, a lover of music, and a good tennis-player. Her holidays were spent abroad or in the Yorkshire dales. She was one of the first soroptimists in Leeds and a keen supporter of the Federation of University Women and of the Medical Women's Federation. In personality as in physique she was built on magnificent lines : honest and courageous, big and beautifully proportioned, with charm of voice and carriage, she was a joy to see or hear. Perhaps she was at her best in her beautiful and comfortable home, for she was the soul of hospitality and always ready to help a friend. She was not as strong as she looked, but she seemed to be in good form and happier than ever in her work when she developed septicæmia and died on Jan. 26 after five days' illness. Many are proud of her friendship and grateful for knowing her.

HUMPHREY DOUGLAS GARDNER

M.B. CAMB.

Dr. Humphrey Gardner, who died at Byfleet on Jan. 17, after a short illness, at the age of 49, had more than a hint of the Napoleonic about him both in appearance and character. He always had a great zest for life though his father's early death had thrust heavy responsibilities on him while he was still an undergraduate at Trinity College, Cambridge. In 1916 Gardner qualified from University College Hospital where he held house-appointments, and he served as a major in the last war. Before starting in practice at Cooden, near Bexhill-on-Sea, Gardner held resident appointments at Addenbrooke's and at the East London Hospital for Children. At Cooden and later when he moved to Woking he always took particular interest in his work for infants and children. Last summer he had a serious illness which probably opened the way to his early death from pneumonia. He leaves his widow with one daughter.

Captain ROBERT KELLOCK, R.A.M.C., who died of wounds in the Middle East on Dec. 31, at the age of 28, was the only son of Mr. Hugh Kellock of Leicester. He graduated from the University of Glasgow in 1937, and held the posts of house-surgeon and resident surgical officer at North Ormesby Hospital, Middlesbrough. General practice attracted him and he joined a firm at Loughborough; his patients and his friends will recall his happy personality. He joined the R.A.M.C. in February, 1940.

Frank Sproston, Leicester

Flight-Lieutenant LEO MALCOLM MAGURK, M.R.C.S., was killed by enemy action at the end of last year. He was born in 1915 and went up to the Middlesex Hospital in 1933. His teachers remember him as a hard worker, and his contemporaries as an able business manager of the hospital journal and a creditable squash player. He qualified in 1939 and after holding several short hospital appointments he joined the R.A.F.V.R. the following year. In 1941 he was posted to the Far East command. His home was at Ipswich.

Medical News

University of Cambridge

The Raymond Horton-Smith Prize for 1940-41 has been awarded to Dr. J. O. Poynton, for his essay on the tuberculosis problem and endemic filariasis in the Federated Malay States.

Royal College of Surgeons of England

At a meeting of the council held on Feb. 12, with Sir Alfred Webb-Johnson, the president, in the chair, the following were re-elected members of the court of examiners: Mr. E. K. Martin, Prof. A. W. Sheen, Mr. W. H. Bowen, Mr. John Morley and Mr. P. J. Moir. Prof. Harry Platt was appointed Robert Jones lecturer for 1942. Surgeon Rear-Admiral C. P. G. Wakeley was appointed representative of the College on the General Medical Council, and Sir Robert Kelly was reappointed representative on the court of the University of Liverpool.

A diploma of fellowship was granted to J. R. Belcher and to A. F. Rushforth.

Diplomas of membership were granted to R. M. Archer, R. D. Brawn and P. R. C. Evans and to the candidates named in the report of the comitia of the Royal College of Physicians in our issue of Feb. 7 (p. 187). Diplomas in public health and medical radiology were also granted, jointly with the Royal College of Physicians, to the candidates names in the same report.

Surgeon Rear-Admiral G. Gordon-Taylor will deliver a Bradshaw lecture to the college on Thursday, Feb. 26, at 2.30 P.M. He will speak on abdominal injuries of modern warfare. The Hunterian lecture which he was to have given on that day has been cancelled.

At the Buckston Browne lunch of the College on Feb. 12 Sir Alfred Webb-Johnson for the first time welcomed women fellows and members—led by the Princess Royal—as guests. Other guests included Professor Stomski, Polish minister of information, representing his president, and Prof. A. T. Jurasz, who had just been admitted to the honorary fellowship of the college. Speaking of the loss of much of the Hunterian collection, Sir Alfred reminded his listeners that in planning for the future they must reconcile progress and tradition, and assess what parts of the collection had become an historic monument and what parts remained essential stepping-stones. Hunter's fame rested on his consistent and expert use of the experimental method in the study of living processes. The college was well equipped for experimental work at the Bernhard Baron laboratories and the Buckston Browne research farm. Both of these institutions had handsome endowments, but to make sure of their continued usefulness endowments must also be obtained for professorships of human and comparative anatomy and of human and comparative pathology, for the financial resources of the college must be largely pledged to restore the museum. The president with Webb-Johnsonian turn of phrase remarked that in these times of general restriction the company might not be able to leave the table echoing Luther's remark after the diet of Worms—"I could take no other course"—and proposed the toast:

Here's a health and drink it down
To our oldest classmate—Buckston Browne.

Medical Society of London

A meeting of this society will be held at 11, Chandos Street, London, W.1, on Monday, Feb. 23, at 4.30 P.M., when Mr. H. E. Griffiths, Colonel F. D. Howitt and Dr. D. C. Norris will open a discussion on rehabilitation.

Radiotherapeutic Research Unit

The radiotherapeutic research unit of the Medical Research Council, formerly known as radium beam therapy research, has resumed clinical work in new quarters provided by the London County Council at Hammersmith Hospital. For the present this work will be confined to the treatment by radium-beam therapy or X rays of cases of carcinoma affecting the buccal cavity, tongue, pharynx and larynx. Dr. Constance Wood, the director, would be glad to have suitable cases referred to her: these should be patients who have had no previous treatment, either surgical or radiological, and preferably not in an advanced stage of the disease. The physical work under the charge of Mr. L. G. Grimmett, which has meanwhile been continued in temporary quarters at the Imperial College of Science and Technology, has also been transferred to Hammersmith Hospital.

Nutrition Society

The meeting of this society arranged for Feb. 28 will be held at the London School of Hygiene, Keppel Street, W.C.1, and not in Cambridge as announced in our last issue. Further information about the society can be obtained from the hon. secretary, Mr. L. J. Harris, D.Sc., Dunn Nutritional Laboratory, Milton Road, Cambridge.

Ex-Service Welfare Society

A conference will be held by this society at the Royal College of Physicians of Edinburgh on Friday, March 6, at 10 A.M., when there will be a discussion on the after-care of neurotic war casualties. Further information may be had from Major C. E. Thwaites, M.R.C.S., Milner House, Ermyn Way, Leatherhead.

Royal Society of Medicine

A meeting of the section of odontology of this society will be held on Monday, Feb. 23, at 2.30 P.M., when Dr. H. T. Roper-Hall, L.D.S., will read a paper on the pathological absorption of the teeth. The section of urology will meet on Feb. 26, at 4.30 P.M., when Mr. William Graham will speak on phenothiazine as a urinary antiseptic and Mr. A. Wilfred Adams on refractory ulcerative cystitis. At the section of epidemiology and state medicine on Feb. 27 at 2.30 P.M. Dr. Robert Cruickshank will open a discussion on cross-infection in wards. There will be a meeting of the section of radiology at 2.30 P.M., on the same day, at Hammersmith Hospital, Ducane Road, W.12, when cases will be shown.

Employment of Alien Doctors

The regulations governing the employment of alien doctors of enemy nationality in EMS hospitals have been further relaxed and in future these practitioners may be employed where there is only one other British resident. In the hospitals where there is only a single resident the employment of an alien will probably also be allowed but permission must first be obtained from the Minister of Health. Similarly in larger hospitals two aliens may be employed where there is a total staff of 14 or 15 doctors and three aliens where there is a staff of 25. The policy of employing these friendly aliens has been amply justified but the Minister of Health points out that many who possess suitable experience and qualifications are still unemployed. He hopes that as vacancies occur hospital authorities will fill them with aliens as a matter of course.

Pneumonia jackets are not subject to rationing and should be supplied coupon-free.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

Births, Marriages and Deaths

BIRTHS

COYLE.—On Feb. 11, in London, the wife of Dr. Cecil Coyle—a son.
DICK.—On Feb. 3, in Leeds, the wife of Captain A. Peter Dick, R.A.M.C.—a daughter.
GABB.—On Feb. 9, in Oxford, the wife of Major Hoadley Gabb, R.A.M.C.—a son.
MAYBURY.—On Feb. 12, at Godalming, the wife of Mr. B. C. Maybury, F.R.C.S.—a daughter.
PARSONS.—On Feb. 8, the wife of Dr. C. T. E. Parsons, of Mildenhall—a son.
SANDELL.—On Feb. 12, the wife of Dr. L. J. Sandell, of Epsom—a son.

MARRIAGES

BARRIE—CASTLETON.—On Feb. 7, at Kettlewell, Howard John Barrie, B.M., to Olive Margaret Joan Castleton.

DEATHS

CARRUTHERS.—On Feb. 13, at Taunton, John Carruthers, M.D. GLASG., late of Chatsworth Gardens, Eastbourne.
CUTCLIFFE.—On Feb. 11, at Torquay, Montagu Cutcliffe, M.R.C.S., aged 72.
DAVIS.—On Jan. 29, George Bertram Davis, M.B. LOND., F.R.C.S., medical officer, S. Rhodesia, aged 31.
HAYES.—On Feb. 10, Edwin Charles Hayes, C.B.E., L.R.C.P.E., D.P.H., lieut.-colonel R.A.M.C., retd., aged 73.
HEBB.—On Feb. 15, at Ronkswood Hospital, Worcester, Sir John Hebb, C.B., C.B.E., B.M. OXFD.
LIGHTSTONE.—On Feb. 12, Herbert Lightstone, D.S.O., M.C., M.D. MCGILL.
NEWMAN.—On Feb. 10, at Bishop's Stortford, John Campin Newman, O.B.E., M.B. CAMB., F.R.C.S., aged 69.
PAPILLON.—On Feb. 11, at Taunton, James William Papillon, M.R.C.S., of Brent Knoll, Somerset.
WITHERS.—On Feb. 10, at Dorchester, Samuel Henry Withers, C.M.G., M.B. R.C.I., lieut.-colonel R.A.M.C., retd.
YOUNG.—On Feb. 13, at Windermere, John Doctor Young, M.D. GLASG., late of Blackpool, aged 76.

Notes, Comments and Abstracts

TUBERCULOSIS: THE PREVENTIVE APPROACH

In the British Isles about 1500 people between the ages of 15 and 50 die every month of pulmonary tuberculosis. In times of peace the total number of patients with tuberculosis, amounting to about a quarter of a million, is maintained by a steady flow of new cases; in war-time both new cases and deaths increase. Long familiar with these dreadful facts, the National Association for the Prevention of Tuberculosis has set out a policy for the discovery of symptomless pulmonary tuberculosis in a memorandum addressed to general practitioners and all others concerned with the health of young people of school age or about to enter industry or the public or national services.

Tuberculosis of the lungs begins without the patient's knowledge, and by the time he comes for treatment the disease is advanced and he has probably already infected others. Prevention must therefore depend on discovering patients in the early stages, before they have become infectious. At present this can only be done by X-ray examination of the chest, which can nowadays be carried out rapidly on large numbers of people. The association believe that more X-ray examinations of apparently healthy people, especially those in their teens and early twenties, are needed; and that if they understood the value of the method, the public would insist that it should take the place of older, less effective methods. The Trades Union Congress of September 1941 was in favour of X-ray examinations of young workers, and passed a resolution urging the Government to provide for such an examination, to be carried out not less than a year after young people enter industry, and to be repeated every year until they reach the age of 18. In the opinion of the association, every young person ought to be examined radiologically on leaving school as well as at intervals during early adult life. Those who enter the Forces could most easily be included in such a scheme, but it should also be possible to bring in those entering the service of the Government or of local authorities, as a safeguard not only to themselves but to their fellows. Youths and girls in secondary and technical schools, and colleges and universities are also at a period of life when physical and mental strain is great and the incidence of tuberculosis high. The association appeals to doctors responsible for health in such institutions to inaugurate or encourage the use of routine X-ray examinations. Many workers in the offices and factories of commercial firms are not entitled to pensions and come under no regular scheme of medical examination except National Health Insurance. Some employers arrange for medical inspection, including X-ray examination, and this is carried out with the approval and coöperation of the workers.

The tuberculosis services—which have grown up for the most part since the last war—can normally deal with the patients sent to them; but they deal largely with those who are already ill. The association is urging an advance in prevention. Since English government proceeds by consent, it is for public opinion to achieve this advance. It should go hand in hand with provision of greater economic security for the tuberculosis family as part of a national scheme of social welfare; this in turn would encourage tuberculous patients to seek early treatment. The memorandum ends with the significant remark that X-ray manufacturers will shortly be ready to provide apparatus as soon as they receive orders.

VITAMINS AND HÆMORRHAGE

In his Honyman-Gillespie lecture on Jan. 22 Dr. Harold Scarborough said that it was possible to support the conception that all forms of bleeding were due to trauma if one included the physiological stresses and strains of muscular movement and the upright posture. The mechanism of hæmostasis was complex and might be defective in coagulation time, in bleeding time, clot retraction, number and quality of platelets, capillary integrity, or intravascular pressure. In thrombocytopenic purpura, he said, it had been suggested that vitamin C might lessen the hæmorrhagic tendency since in this condition the capillaries were abnormal. He had been unable to show in his cases that vitamin C had any such effect; nor had vitamin A been more successful, though thrombocytopenia had long been known to occur in A-deficient rats. Evidence had been obtained by Schiff and Hirschberger that the substance in some preparations of vitamin A which was active in increasing the thrombocyte count was a fat-soluble substance distinct from vitamin A which they designated vitamin T; but the existence of this substance was still doubtful. The hæmorrhagic tendency in jaundice had been shown to be due to a prothrombin deficiency resulting from impaired absorption of vitamin K when bile was absent from the intestine. Low prothrombin values were found in other conditions—for example, in sprue, which was associated with defective fat absorption. The action of vitamin K in increasing the plasma prothrombin and correcting the coagulation defect depended on adequate hepatic function. Low prothrombin values were found in disorders of the liver without jaundice, and in these the parenteral administration of vitamin K did not remedy the defect. Ivy and his associates had shown that a large number of patients with jaundice had bleeding times longer than the average, and that this defect was benefited by vitamin D, which not only increased the thrombocyte count but shortened the coagulation time. In one case of prolonged obstructive jaundice Dr. Scarborough had been able to show that nikethamide (nicotinic acid diethyl amide) reduced the abnormal capillary fragility. In scurvy there was a hæmorrhagic tendency associated with increased capillary fragility. The results of tests of capillary fragility in scurvy had to be assessed with care since the fragility lessened immediately after a subcutaneous hæmorrhage and might then be normal; whereas just before the hæmorrhage, or some time afterwards, it was greatly increased. The hæmorrhages of scurvy could be arrested and controlled by the administration of vitamin C but this did not diminish the fragility of the capillaries. When natural vitamin C was given in the form of citrus fruit juice both the bleeding and the capillary fragility were improved, owing to the fact that vitamin C was accompanied in its natural sources by the water-soluble vitamin P. The capillary fragility of scurvy could be favourably influenced by the administration of pure vitamin P and when vitamins C and P were given together in pure form bleeding was stopped and the fragility of the capillaries became normal.

MAKING SPIRIT NASTY

Two new formulæ—which contain brucine instead of diethyl phthalate—for surgical spirit have been approved by the Commissioners of Customs and Excise. The quantity of alkaloid used is gr. 10 per gallon, which is equivalent to about 0·014%. The formulæ which have been in use during the past ten years contained 2% of diethyl phthalate in addition to other denaturants. The approved formulæ therefore contain a basis of industrial methylated spirit—that is, 95% of 95% ethyl alcohol denatured with 5% of crude methyl alcohol—with additional denaturants to make the liquid nauseous. These additional denaturants are now: castor oil, methyl salicylate and brucine; or castor oil, mineral naphtha and brucine. Diethyl phthalate, now replaced, has many industrial uses, including the manufacture of varnish for aircraft; so that the present substitution releases a valuable material. A recent ruling of the Home Office given in the Poisons Amendment Rules, 1942, exempts surgical spirit containing less than 0·015% of brucine from the Pharmacy and Poisons Act, 1933, and the poisons rules; otherwise the sale of brucine is not affected. The methylated spirit regulations, 1930, which require surgical spirit to be labelled "For external use only—not to be taken" still apply to all sales of the spirit.

Appointments

CALVERLEY, MARIE, M.B. LEEDS, D.R.C.O.G.: R.M.O. at St. John's Emergency Maternity Home, Western Favell, Northamptonshire.

DUNLOP, E. McH. NAIRN, L.R.C.P.E.: R.S.O. at Mount Gold Hospital, Plymouth.

KRAMER, M. V., M.B. WITWATERSRAND, F.R.C.S.E.: R.S.O. at the County Hospital, Whiston, Lancs.

LAUDER, ANNE, M.B. EDIN.: asst. R.M.O. at Warren Road Hospital, Guildford.

MCLENNAN, W. A., M.B. GLASG., D.P.H.: M.O. to the B.S.A. Company, Birmingham.

YEARSLEY, MACLEOD, F.R.C.S.: aural surgeon to Lyncroft Nursing Home, Gerrard's Cross.

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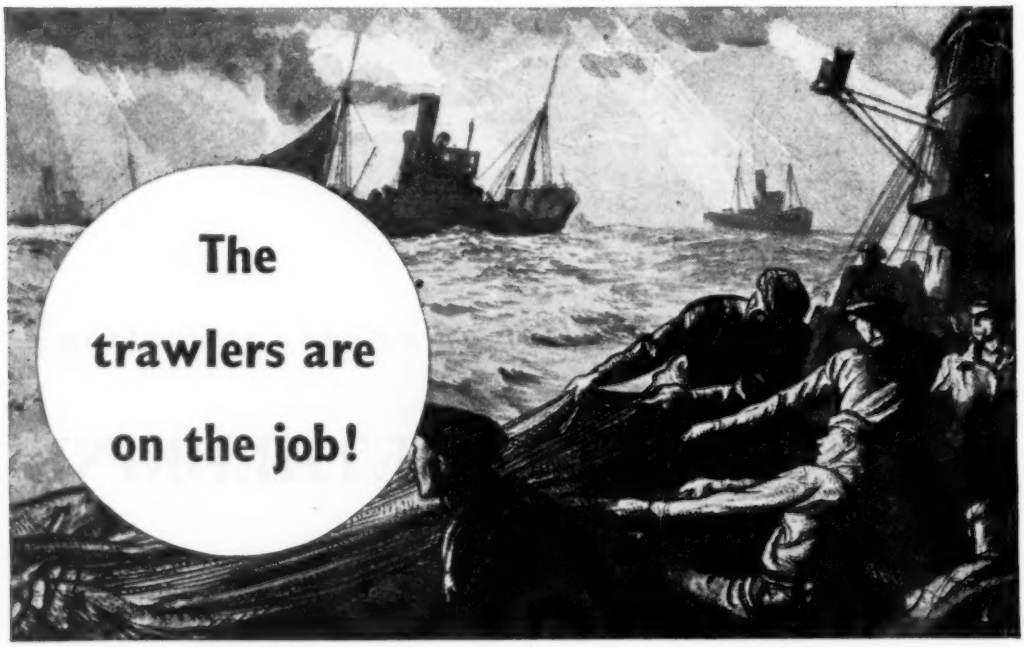

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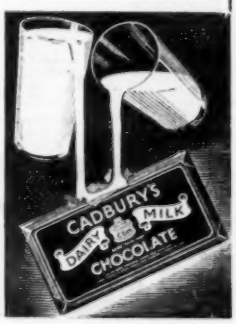

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has been before the profession now for fifteen years and has stood the test of time, and the developments indicated point to still greater usefulness for this product in the future

(The Prescriber, Jan. 1938)

A Pamphlet entitled "Hyperpiesia, Metabolic Disorders, and the Anaemias"
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A safeguard against infection and a prophylactic against the Common Cold. Also prescribed for rapid adaptation of vision in semi-darkness. Supplies anti-rachitic or "Sunshine" vitamin during Pregnancy and Lactation, or for Infants.

In tins of 25 Capsules.
Also in bottles of 250, 500 and 1,000.

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VITAMIN 'B_1'
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For the treatment of Polyneuritis, Neuralgia, Sciatica, Nervous Debility, Loss of Appetite, Gastric Intestinal Disorders, &c. Specially useful in cases of B_1 deficiency in Pregnancy and Lactation.

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Iron 'Jelloids' are an elegant and reliable means of administering the protocarbonate of iron. The preparation has none of the disadvantages of Pil. Blaud. The iron content remains fresh and unoxidised indefinitely, and injury to teeth is avoided.

The 'Jelloids' are highly effective in the treatment of achlorhydric anæmia and indeed in all the simple anæmias in which massive iron therapy is indicated.

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You are cordially invited to apply for samples for clinical test.
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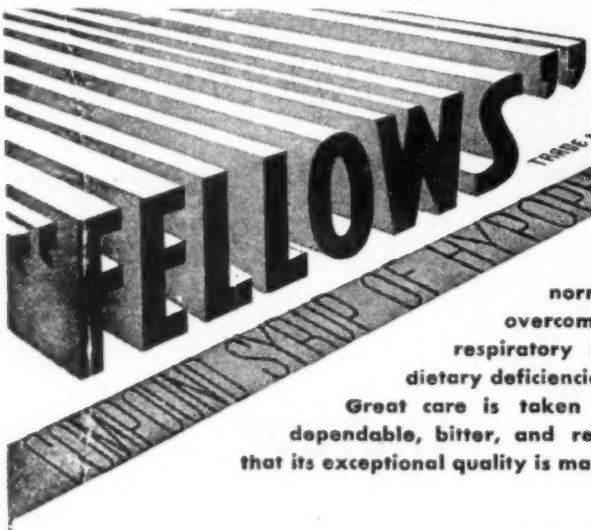

supplies valuable mineral salts which aid the normal cell processes, and help to overcome the devitalizing effects of respiratory infections, pregnancy, and dietary deficiencies.

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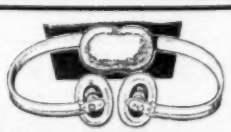

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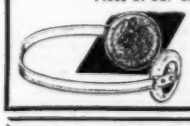

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Royal College of Physicians of London.

The next ordinary PROFESSIONAL EXAMINATION for the MEMBERSHIP will commence on WEDNESDAY, 8TH APRIL, 1942.

Candidates are required to give twenty-one days' notice in writing to the Registrar of the College, to whom all certificates and testimonials required by the Bye-laws must be sent at the same time.

Candidates who propose to submit published work under the regulations now in force are required to give twenty-eight days' notice, and should apply in writing to the Registrar, without delay, for detailed instructions as to the procedure they should follow. REGINALD HILTON, M.D., Assistant Registrar.

Pall Mall East, S.W.1.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, March 9th, April 13th, May 11th, 1942; MEDICINE, March 16th, April 20th, May 18th, 1942: MIDWIFERY, March 17th, April 21st, May 19th, 1942.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

University of Oxford.

DIPLOMA IN OPHTHALMOLOGY.

The next EXAMINATION for the Diploma will be held on 22ND JUNE, 1942.

Two months' course of post-graduate Lectures in Ophthalmology and allied subjects will commence on MONDAY, 27TH APRIL, 1942. Clinical work in conjunction with the lectures is available at the Oxford Eye Hospital.

All candidates have to produce a certificate showing that they have duly attended a course of clinical ophthalmology for twelve calendar months in connexion with hospitals or institutions recognised for the purpose by the Board of the Faculty of Medicine.

For further information apply to the Reader in Ophthalmology, Oxford Eye Hospital.

IDA MANN, Margaret Ogilvie Reader in Ophthalmology.

Examining Board in England

BY THE
ROYAL COLLEGE OF PHYSICIANS OF LONDON
AND THE
ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Notice is hereby given that the following Examination will commence on the date stated below :—

DIPLOMA IN CHILD HEALTH,
MONDAY, 23RD MARCH.

Candidates who have fulfilled the necessary conditions and who desire to present themselves for examination must give notice in writing to the Secretary, Examination Hall, 8–11, Queen-square, London, W.C.1, at least twenty-one days before the date of the Examination, transmitting at the same time such certificates as may be required by the Regulations of the Board. HORACE H. REW, Secretary.

London County Council.

MAUDSLEY HOSPITAL MEDICAL SCHOOL.
(UNIVERSITY OF LONDON.)

PSYCHOLOGICAL MEDICINE.

A series of lectures on General Principles of Psychiatry suitable for Part II of the examination for a Diploma in Psychological Medicine will be held at the Maudsley Hospital, Denmark Hill, S.E.5, on Mondays, Wednesdays, and Fridays from 2 to 4 P.M., commencing 2ND MARCH, 1942.

Eight Lectures on SYMPTOMATOLOGY.
By AUBREY LEWIS, M.D., F.R.C.P.

Six Lectures on CAUSATION AND GENETICS AS APPLIED TO PSYCHIATRY.
By ELIOT SLATER, M.B., M.R.C.P., D.P.M.

Six Lectures on PHYSICAL TREATMENT OF MENTAL DISORDERS.
By WILLIAM SARGANT, M.B., M.R.C.P.

Four Lectures on THE SOCIAL ASPECTS OF PSYCHIATRY.
By A. B. STOKES, B.M., M.R.C.P., D.P.M.

Two Lectures on ADMINISTRATIVE PROCEDURE IN MENTAL HOSPITALS.
By A. A. W. PETRIE, M.D., F.R.C.P.

The fee for the above course is £3 3s., which is payable at the time of enrolment.

Further series of lectures and demonstrations suitable for Part II of the D.P.M. examination will be arranged to take place in April and May.

BRITISH POSTGRADUATE MEDICAL SCHOOL
(UNIVERSITY OF LONDON)

WAR SURGERY OF NERVOUS SYSTEM
2nd to 6th March, 1942

Monday, 2nd March	10 A.M.	The Surgical Anatomy of the Skull and Brain.	Mr. G. C. Knight, F.R.C.S.
	10.30 A.M.	(*a*) Mechanism and Nature of the Injuries of the Skull. (*b*) Mechanism and Nature of the Concomitant Injury to the Brain.	Mr. G. C. Knight, F.R.C.S.
	2 P.M.	Demonstrations on the Cadaver of Operations on Skull and Brain.	Mr. A. K. Henry, F.R.C.S.
Tuesday, 3rd March	10 A.M.	(*a*) Closed Injuries of Skull and Brain: their Complications and Management. (*b*) Immediate Treatment and Management of Wounds of Skull and Brain.	Mr. D. W. C. Northfield, M.S., F.R.C.S.
	2 P.M	Pathology of Wounds of the Nervous System.	Dr. J. G. Greenfield, M.D., F.R.C.P.
Wednesday, 4th March	10 A.M.	Surgical Sequelæ of Wounds of Skull and Brain.	Mr. G. C. Knight, F.R.C.S.
	12.15 P.M.	Use of X-rays in the Diagnosis of Head Injuries.	Dr. J. Duncan White, M.B., Ch.B., D.M.R.E.
	2 P.M.	Disorders following Head Injuries.	Dr. J. Purdon Martin, M.D., F.R.C.P.
	3.15 P.M.	Hysterical Disorders Associated with War Wounds.	Dr. Aubrey Lewis, M.D., F.R.C.P.
Thursday, 5th March	10 A.M.	Some Sequelæ of War Wounds of Skull and Brain.	Mr. Harvey Jackson, F.R.C.S.
	11.30 A.M.	War Injuries of the Spinal Cord.	Prof. Lambert Rogers, F.R.C.S., F.A.C.S., F.R.A.C.S.
	1.30 P.M.	X-rays in War Injuries of the Spine.	Dr. J. Duncan White, M.B., Ch.B., D.M.R.E.
	2 P.M.	Demonstration on the Cadaver of Operations on the Spine.	Mr. A. K. Henry, F.R.C.S.
Friday, 6th March	10 A.M.	Peripheral Nerve Injuries: (1) Diagnosis.	Prof. H. J. Seddon, D.M., F.R.C.S.
	11.30 A.M.	Peripheral Nerve Injuries: (2) Treatment.	Prof. H. J. Seddon, D.M., F.R.C.S.
	2.15 P.M.	Possibilities of Nerve Grafting.	Mr. F. H. Bentley, F.R.C.S.
	3.15 P.M.	Care of Bladder in Injuries of the Nervous System.	Mr. C. Morson, O.B.E., F.R.C.S.

The fee for the Course is one guinea. Officers of the Armed Forces wishing to attend these lectures without payment of the fee should apply through their respective Director-Generals. Applications for admission should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, W.12.

Further War Surgery Courses will be held as follows:—

OPERATIVE SURGERY IN WARTIME, INCLUDING CADAVER SURGERY (limited to 20) ..	16TH TO 21ST MARCH, 1942.
WAR SURGERY OF THE EXTREMITIES ..	13TH TO 17TH APRIL, 1942.

Tancred's Studentships.

About Whitsuntide next the Governors and Trustees propose to elect one Student in Divinity at Christ's College, Cambridge, one Student in Physic at Gonville and Caius College, Cambridge, and one Student in Law at Lincoln's Inn.

Candidates must have been born in England, Scotland, or Wales, and be members of the Church of England and unmarried.

An examination will be held at Gonville and Caius College on Wednesday, 15th April, for Divinity and Physic candidates, who must be within the ages of 17 and 20 years. There will be no examination for the Law candidates, who must be within the ages of 19 and 23 years.

The annual stipend of each Student is £100.

The last day for sending in petitions is 10th March.

Applications, stating kind of Studentship and mentioning this paper, should be made to the Clerk, Mr. CHOLMELEY, 28, Lincoln's Inn-fields, London, W.C.2.

National Hospital Queen Square for
DISEASES OF THE NERVOUS SYSTEM,
Queen-square, W.C.1.

A series of CLINICAL DEMONSTRATIONS and LECTURES on NEUROLOGY will be given at this Hospital, at 4.30 P.M. on weekdays from Monday to Friday, from 23rd February to 27th March.

These demonstrations will be open free to all Medical Men and Women and to Senior Medical Students.

CITY OF LONDON MENTAL HOSPITAL
Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

CHISWICK HOUSE,
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A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M

FENSTANTON
at "FIVE DIAMONDS," Chalfont St. Giles, Bucks

A Private Home for the Care and Treatment of a limited number of LADIES with Mental and Nervous Disorders. Certified, Voluntary, and Temporary Patients received. Mansion with 12 acres of ground. (See *Medical Directory*, p. 2362.) Apply Resident Physician. Telephone: Little Chalfont 2046. Station: Chalfont and Latimer.

CALDECOTE HALL
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Residential treatment of
"Nervous Disorders" & Alcoholism
(Certifiable cases are not received)

This beautiful mansion situated in the heart of the country (less than two hours from London by L.M.S.R.) and surrounded by charming pleasure grounds in which games and outdoor occupational therapy are available is devoted to the treatment of Alcoholism and "Nerves" by psychotherapeutic and ancillary methods.

Illustrated Brochure and particulars obtainable from A. E. CARVER, M.D., D.P.M., Resident Medical Superintendent.

CAMBERWELL HOUSE, 33, Peckham Road, London, S.E.5
Telegrams: "PHRENOLIA, LONDON" — FOR THE TREATMENT OF MENTAL DISORDERS — *Telephone:* RODNEY 4242 (2 lines)

Completely detached Villas for mild cases. Voluntary Patients received. Twenty acres of grounds; own garden produce. Hard and grass tennis courts, putting greens, Recreation Hall with Badminton Court, and all indoor amusements. Occupational therapy, Calisthenics, Actino-therapy, prolonged immersion baths, shock and also modified insulin treatment. Chapel.

Senior Physician, Dr. HUBERT JAMES NORMAN, assisted by a resident Medical Staff and visiting Consultants

An illustrated Prospectus giving fees, which are strictly moderate, may be obtained upon application to the Secretary

The Convalescent Branch is HOVE VILLA, BRIGHTON, and is 200 ft. above sea-level

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MAGHULL (near LIVERPOOL)

FARMING and OPEN AIR OCCUPATION for PATIENTS
A few vacancies in 1st and 2nd Class Houses.
FEES: 1st Class (men only) from £3 per week upwards.
2nd Class (men and women) 32/- per week.
For further particulars apply: **C. EDGAR GRISEWOOD, A.C.A.**
Secretary, 20, Exchange Street East, Liverpool, 2

THE GROVE HOUSE,
CHURCH STRETTON, SHROPSHIRE.

Private Home for Ladies mentally ill. Voluntary and Temporary Patients received.

Medical Superintendent: Dr. J. A. McCLINTOCK.

Telephone: WELbeck 2728 Telegrams: "ASSISTIAMO, LONDON"
For MEDICAL, SURGICAL, and
MENTAL NURSES
Male or Female
THE NURSES' ASSOCIATION
In conjunction with the MALE NURSES' ASSN.
29, YORK ST., BAKER ST., LONDON, W.1
Mrs. MILLICENT HICKS, *Superintendent* W. J. HICKS, *Secretary*

PECKHAM HOUSE, 112, Peckham Road, London, S.E.15

Telegrams: "Alleviated, London" **Telephone: Rodney 2641-2642**

A Private Mental Hospital, for Ladies and Gentlemen suffering from Nervous and Mental Illness, where the amenities of a comfortable home are combined with full investigation and every well-established modern treatment.

Terms from 3½ guineas weekly.

Illustrated Prospectus may be obtained from the Physician Superintendent.

SPRINGFIELD HOUSE

Phone: BEDFORD 3417. **Near BEDFORD**

For Mental Cases with or without Certificates.

Ordinary Terms: Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

The Royal Cancer Hospital (Free)

(Incorporated under Royal Charter),
Fulham-road, London, S.W.3.

The Committee are prepared to receive applications for the post of DIRECTOR OF THE PATHOLOGICAL DEPARTMENT. Experience in Clinical Pathology essential. Salary £1000 per annum. The appointment is a temporary one and terminable within twelve months of the conclusion of hostilities. The appointment is subject to rules, a copy of which can be obtained from the Secretary.

Applications, accompanied by copies of not more than three recent testimonials, to be sent to the Secretary not later than Monday, 9th March, 1942. CLEMENT COBBOLD, Secretary.

The Royal Cancer Hospital (Free)

(Incorporated under Royal Charter),
Fulham-road, London, S.W.3.

Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER (B1), to commence duties on 1st April, 1942. Applicants should have held house appointments and had surgical experience. The appointment is for twelve months at a salary at the rate of £350 per annum, with board, residence, and laundry. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply.

Applications, to be made on a form which will be supplied by the Secretary, with copies of not more than three recent testimonials, to be sent to the Secretary not later than the first post on Wednesday, 11th March, 1942.

CLEMENT COBBOLD, Secretary.

St. Thomas's Hospital.

APPOINTMENT OF RESIDENT ASSISTANT SURGEON (B1).

To commence on or about the 17th April, 1942, for a term of one year, eligible for reappointment. Salary at the rate of £350 per annum, with full residential emoluments.

APPOINTMENT OF TWO SURGICAL REGISTRARS (B1).

To commence on or about 17th April, 1942, for a term of one year, eligible for reappointment. Salary at the rate of £250 per annum, with full residential emoluments. (*Note.*—It is possible that one of the successful candidates may be appointed to a more senior post carrying a higher salary.)

Applications for the above three posts are invited from British registered medical practitioners. Applicants should have held house appointments and had surgical experience. Candidates must hold the diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply.

Applications, stating age, qualifications with dates, and present post, should be sent to the undersigned not later than 28th February, 1942. Application forms may be obtained from the Secretary's office. ROBERT BORLEY, Secretary.

St. Thomas's Hospital, London, S.E.1.

Queen Charlotte's Maternity Hospital,

Goldhawk-road, Hammersmith, W.6.

Applications are invited from registered medical practitioners for the following appointments:—

ASSISTANT RESIDENT MEDICAL OFFICER (B1), for three months. Salary £80 per annum. Suitably qualified R practitioners holding B2 or B1 posts may apply.

DISTRICT RESIDENT MEDICAL OFFICER (B2), for three months. Salary £90 per annum, allowance for car for district travelling. R practitioners holding A posts may apply.

To commence duties on 1st April, 1942. These appointments do not exceed six months. Full residential emoluments.

The Assistant Resident Medical Officer is appointed for three months, and on completion will be expected to apply for the post of Senior Resident Medical Officer (B1) (salary £100 per annum), also for three months. Sixty Obstetric Beds are open in the new Patients' Block, and the Hospital has a large district for domiciliary midwifery.

Applications, stating age, qualifications with dates, nationality, previous appointments, and accompanied by copies of three recent testimonials, should be sent by the 9th March to—

SEYMOUR LESLIE, Acting Secretary-Superintendent.

Hospital for Consumption and Diseases

OF THE CHEST, Brompton, S.W.3.

Applications are invited for the following appointments from registered medical practitioners, Male and Female, including R practitioners who now hold A posts:—

HOUSE PHYSICIANS (B2), for which there are two vacancies. The duties include work in the Out-patient Department as well as in the wards, and the appointment is for six months, commencing on 1st May, with an honorarium of £50.

HOUSE PHYSICIAN (B2) at the SANATORIUM at FRIMLEY. The appointment is for six months, commencing on 1st May, with an honorarium of £50.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of one or more recent testimonials, should reach the undersigned not later than Saturday, 7th March, 1942.

Brompton, February, 1942. F. G. ROUVRAY, Secretary.

Wembley Hospital.

(118 Beds.)

Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT SURGICAL OFFICER at a salary of £450 per annum, together with board, residence, and laundry. To commence duties as soon as possible after 8th March. Applicants will be expected to do emergency surgery and therefore should have had the necessary experience. The post will probably include M.S. surgery.

Applications, stating age, qualifications, and any testimonials available, should be sent not later than Saturday, 28th February, to: G. A. PAINES, F.C.I.S., House Governor.

Resident Junior Assistant Medical

OFFICER (B2) required by MIDDLESEX COUNTY COUNCIL for NORTH MIDDLESEX COUNTY HOSPITAL, Edmonton, N.18. Applications invited from registered medical practitioners, Men or Women, who have held resident appointments in general hospitals, and also from R practitioners who now hold A posts. Salary £250 per annum, plus cost-of-living bonus. Board, lodging, and laundry. Whole-time general medical and surgical duties such as Council may direct under supervision of Medical Superintendent. Appointment, subject to medical examination and one month's notice, is for six months with possibility of extension to twelve months (except in case of R practitioners). Post vacant 22nd March, 1942.

Application, stating age, qualifications with dates, nationality, present post, and previous appointments, to the undersigned. No application forms provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 7th March, 1942.

C. W. RADCLIFFE, "B3," Clerk of the County Council.

Guildhall, Westminster, S.W.1.

Middlesex County Council.

ASSISTANT MEDICAL OFFICER (Temporary) required in Public Health and School Medical Department. Qualified registered medical practitioners, with special experience in antenatal work. Public Health degree or diploma desirable. Whole-time duties under County Medical Officer include medical inspection of school-children, supervision of treatment of minor ailments, carrying out work under maternity and child welfare scheme, &c. Salary £600 per annum, with out-of-pocket travelling expenses. Subject to medical examination and one month's notice. Must reside in such district as required.

Written applications, giving age, qualifications, and experience, with copies of not more than three recent testimonials, to the undersigned by 14th March, 1942. Canvassing, directly or indirectly, disqualifies. Application forms not provided.

C. W. RADCLIFFE, "B3," Clerk of the County Council.

Guildhall, Westminster, S.W.1.

Middlesex County Council.

RESIDENT ASSISTANT MEDICAL OFFICER (B1) required for STAINES COUNTY HOSPITAL, Ashford, Middlesex. Applicants must be registered medical practitioners (including suitably qualified R practitioners holding B2 or B1 posts) who have held resident appointments in general hospitals and had experience in treatment of pulmonary tuberculosis. Salary £400 by £25 to £475 per annum. Board, lodging, and laundry. Whole-time duties, such as Council may direct, under supervision of Medical Superintendent. Appointment is for four years only, subject to medical examination and one month's notice.

Application, stating age, nationality, qualifications with dates, experience, and details of previous appointment, to the undermentioned. Application forms not provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 28th February, 1942.

C. W. RADCLIFFE, "B3," Clerk of the County Council.

Guildhall, Westminster, S.W.1.

Middlesex County Council.

NON-RESIDENT ASSISTANT MEDICAL OFFICER (B1) required for WEST MIDDLESEX COUNTY HOSPITAL, Isleworth, Middlesex (must live near Hospital). Applicants must be registered medical practitioners (including suitably qualified R practitioners holding B2 or B1 posts) who have held resident appointments in general hospitals and had special experience in obstetrics and gynæcology. Post now vacant. Salary £400 by £25 to £475 per annum, plus a non-resident cash allowance of £100 per annum. Whole-time duties such as Council may direct under supervision of Medical Superintendent. Appointment is for four years only, subject to medical examination and one month's notice.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, to the undermentioned. Application forms not provided. Relationship to any member or officer of the Council to be disclosed. Copies of not more than three recent testimonials. Canvassing, directly or indirectly, will disqualify. Closing date 7th March, 1942.

C. W. RADCLIFFE, "B3," Clerk of the County Council.
Guildhall, Westminster, S.W.1.

Borough of Ealing.

Applications are invited from duly qualified medical practitioners with a public health qualification for the position of ASSISTANT MEDICAL OFFICER OF HEALTH.

A candidate must have had at least three years' experience in the practice of the profession. The person appointed will be required to carry out medical inspection of school-children and child welfare work, and perform such other duties as may be allotted as Assistant to the Medical Officer of Health and School Medical Officer.

The person appointed will be required to devote their whole time to the duties and will not be allowed to engage in private practice. The salary will be at the rate of £600 per annum, rising by £25 per annum to £700.

A deduction will be made from the salary in accordance with the provisions of the Local Government Officers' Superannuation Act, 1937, and the appointment will be subject to passing the Council's medical examination in connexion therewith. Canvassing will be a disqualification.

Copies of the application forms and terms of appointment can be obtained from Dr. Thomas Orr, Medical Officer of Health, Town Hall, Ealing, W.5, to whom application, accompanied by copies of not more than three recent testimonials, must be delivered not later than the 27th February, 1942.

R. H. WANKLYN, Town Clerk.
Town Hall, Ealing, W.5, 13th February, 1942.

St. Mary's Hospital, London, W.2.

THIRD ASSISTANT PATHOLOGIST (B1).

Applications are invited for the above post. The appointment is for a period of twelve months (the holder to be eligible for re-election for a second period of twelve months) as from a date to be arranged, at a salary of £350 per annum (for the period of the war). Suitably qualified R practitioners holding B2 or B1 appointments may apply.

Applications, stating nationality, date of birth, permanent address, qualifications, and appointments held, together with copies of not more than three testimonials, must reach the undersigned on or before Wednesday, 4th March, 1942.

E. W. STOCKWELL, Secretary.

City of Chester.

Applications are invited for the post of TEMPORARY DEPUTY MEDICAL OFFICER OF HEALTH at a salary of £600 per annum, plus £50 per annum car allowance.

The work includes the duties of medical inspection of school-children, general public health and civil defence work.

The appointment will be subject to three months' notice on either side.

Applications, giving full particulars of experience and qualifications, together with copies of three recent testimonials, must be received by the MEDICAL OFFICER OF HEALTH, Town Hall, Chester, on or before Wednesday, 4th March, 1942. Canvassing will disqualify, and relationship to members or officials of the Council must be disclosed.

Royal Hospital, Richmond, Surrey.

Applications are invited from registered medical practitioners (Male) for the immediate appointment of HOUSE SURGEON (A). R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to the SECRETARY-SUPERINTENDENT.

East Lancashire Homes for Disabled

SAILORS AND SOLDIERS, Broughton House, Park-lane, Kersal, MANCHESTER.

RESIDENT MEDICAL SUPERINTENDENT required shortly. Unmarried man or widower. Quarters, board, and laundry provided. Salary £400 per annum. Post would suit retired Service officer or doctor interested in ex-Servicemen. Duties light.

Apply to E. MESSENGER, F.C.A., Secretary, 40, South King-street, Manchester, 2.

The Radcliffe Infirmary, Oxford.

Applications are invited from registered medical practitioners, Male and Female, for the following appointments to become vacant on the 1st April, 1942 :—

One HOUSE SURGEON (A) } including R practitioners within three months of qualification.
One OBSTETRIC HOUSE PHYSICIAN (A) }
One CASUALTY OFFICER (A) }

Appointments will be for a period of six months. The salary is at the rate of £100 per annum, with full residential emoluments. All Resident Medical Officers will have some anæsthetic duties to perform.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent not later than Monday, 9th March, 1942, to—

February, 1942. A. G. E. SANCTUARY, Administrator.

Northumberland County Council.

HEXHAM HOSPITAL. (440 Beds.)

Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (A). R practitioners within three months of qualification may apply. Appointment will be for a period of six months. Salary £120 per annum, together with the usual residential emoluments. Also for the appointment of HOUSE PHYSICIAN (B2). R practitioners who hold A posts may apply. Appointment will be limited to six months. Salary £250 per annum, together with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of two recent testimonials, should be forwarded to the County Medical Officer at the undermentioned address immediately.

C. HAROLD CARTER, Clerk of the County Council.
New Senior School, Mitford-road, Morpeth, Northumberland.

County Borough of Newport.

JUNIOR RESIDENT MEDICAL OFFICER (A) (TEMPORARY APPOINTMENT).

Applications are invited from registered medical practitioners for the above appointment at WOOLOSTON HOUSE HOSPITAL, Newport. Salary £150 per annum, with the usual residential emoluments, plus a cost-of-living bonus. All fees with the exception of coroners' fees are payable to the Public Assistance Committee. Appointment terminable by one month's notice on either side. R practitioners within three months of qualification may apply.

Applications, stating age, qualifications, and experience, and accompanied by copies of three recent testimonials, should be sent at once to: TOM KAY, Public Assistance Officer.
Town Hall, Newport, Mon., February, 1942.

Worthing Hospital.

Applications are invited for the Temporary post of HONORARY ANÆSTHETIST. Particulars of the appointment can be obtained from the House Governor, Worthing Hospital.

Applications and copies of testimonials should be sent not later than first post Monday, 2nd March, 1942, to—

A. V. OAKTON, House Governor.

Rochdale Infirmary and Dispensary,

LANCS. (110 Beds.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1) at the above Hospital. Applicants should have held house appointments and had surgical experience. Suitably qualified R practitioners holding B1 or B2 appointments are invited to apply.

Salary attached to the appointment is at the rate of £250 per annum, with board, residence, laundry, &c.

Applications, stating age, nationality, &c., accompanied by copies of three recent testimonials, should be sent to the undersigned immediately. The successful candidate must be a member of a medical defence society.

Infirmary Office. W. WYNNE, Secretary.

Royal West Sussex Hospital,

CHICHESTER, SUSSEX. (334 Beds.)

Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (A), vacant 1st March, 1942, including registered practitioners within three months of qualification. Appointment will be for six months. Salary £120 per annum, with full residential emoluments. The post includes general work.

Applications, stating age, qualifications with dates, and nationality, together with copies of three recent testimonials, should reach the undersigned as soon as possible.

K. H. WILLIAMS, House Governor.

Wingfield-Morris Orthopædic Hospital,

OXFORD.

RESIDENT HOUSE SURGEON (B1) (Male) required for six months. Salary at the rate of £120 per annum. Suitably qualified R practitioners holding B2 or B1 posts may apply.

Applications, with testimonials, should be sent to Professor H. J. SEDDON before 28th February, duties to commence soon after that date.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £630 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

Gloucestershire County Council.

Gloucestershire County Council invite applications for the appointment of a TEMPORARY ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH at a salary of £500 per annum. Applicants must be registered medical practitioners and should hold a Diploma in Public Health. The appointment will be subject to a satisfactory medical report by the Council's Medical Adviser.

Forms of application, with particulars of the duties and conditions of appointment, may be obtained from the County Medical Officer of Health, 18, Berkeley-street, Gloucester, to whom completed applications, with copies of three recent testimonials, should be sent not later than the 28th February. Canvassing, directly or indirectly, will disqualify.

RICHARD L. MOON, Clerk of the County Council.

Hampshire County Council.

THE COUNTY COUNCIL HOSPITAL, CLAYHALL-ROAD, ALVERSTOKE, GOSPORT. (61 Beds.)

ASSISTANT RESIDENT MEDICAL OFFICER required at the above Hospital at a salary of £350 per annum (B2). R practitioners holding A posts may apply when appointment will be limited to six months. Must have held a resident surgical hospital appointment and be experienced in administering anæsthetics.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

H. LESLIE CRONK, County Medical Officer.

The Castle, Winchester.

Dorset Mental Hospital,

HERRISON, DORCHESTER.

TEMPORARY ASSISTANT MEDICAL OFFICER (B1) OR LOCUM TENENS.

Applications are invited from registered medical practitioners for the above whole-time appointment. R practitioners holding B2 or B1 appointments may apply. Salary at the rate of £400 per annum, with the usual residential emoluments. Additional £50 if holder of the D.P.M.

Apply, with copy of testimonials, to the MEDICAL SUPERINTENDENT.

City of Salford.

PUBLIC HEALTH DEPARTMENT.

SENIOR CLINICAL TUBERCULOSIS OFFICER.

Applications are invited for the above-mentioned permanent appointment, the salary for which will be at the rate of £750, rising by biennial increments of £50 to £937 10s. per annum, plus a temporary cost-of-living bonus which at present amounts to £24 per annum. The post will become vacant on 15th June, 1942, and is subject to the provisions of the Local Government Superannuation Act, 1937.

Form of application and particulars of appointment may be obtained from the Medical Officer of Health, 143, Regent-road, Salford, 5, by whom applications, accompanied by copies of not more than three recent testimonials, must be received not later than 28th February, 1942. H. H. TOMSON, Town Clerk.

Liverpool and District Hospital for

DISEASES OF THE HEART,
34, Oxford-street, LIVERPOOL, 7.

Applications are invited from registered medical practitioners (Male and Female), including R practitioners within three months of qualification, when appointment will be for a period of six months, for the appointment of a HOUSE PHYSICIAN (A). To commence immediately. Salary is at the rate of £100 per annum, with full residential emoluments. Facilities for M.D. thesis.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned.

Miss J. LEWIS, Secretary.

County Borough of Middlesbrough.

The Middlesbrough Corporation invites applications from registered medical practitioners (Women) for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH, Maternity and Child Welfare.

Applicants must have had experience in antenatal work, midwifery, and diseases of children, with not less than three years' postgraduate experience.

Commencing salary will be at the rate of £550 per annum, with residence, board, and laundry valued at £150, making £700 in all, and rising, subject to satisfactory service, by annual increments of £50 to a maximum of £850.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and to the regulations governing conditions of service made by the Middlesbrough Corporation. The successful candidate will be required to pass a medical examination.

The successful candidate will be required to reside at the Municipal Maternity Hospital, and to devote the whole of her time to the duties of the office, and to act under the direction of the Medical Officer of Health.

Applications, stating age and experience, together with copies of three recent testimonials, must be sent to the Medical Officer of Health, Municipal Buildings, Middlesbrough, immediately.

PRESTON KITCHEN, Town Clerk.

Municipal Buildings, Middlesbrough, 29th January, 1942.

West Cornwall Hospital, Penzance.

(Total 186 Beds.)

Applications are invited from registered medical practitioners, Male, for the appointment of HOUSE SURGEON (A), which became vacant on 20th February, 1942. R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to—

K. I. NEWELL, Secretary-Superintendent.

Newark General Hospital.

(66 Normal Beds.)

Applications are invited from registered medical practitioners (Male and Female) for the appointment of JUNIOR HOUSE SURGEON (A), now vacant. R practitioners within three months of qualification may apply. The appointment is for a period of six months. Salary at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, sex, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

B. C. DION, Secretary-Superintendent.

Royal Eye and Ear Hospital, Bradford.

(94 Beds.)

HOUSE SURGEON (A) (Male or Female) wanted for 1st April. R practitioners within three months of qualification may apply. Salary £180 per annum, with board, residence, and laundry. If held by an R practitioner the appointment will be for a period of six months.

Applications, stating age, nationality, with copies of recent testimonials, to be sent to—

ERNEST S. HEAP, Secretary-Superintendent.

Preston Royal Infirmary.

Applications are invited from registered medical practitioners (unmarried) for the appointment of HOUSE SURGEON (A). R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary at the rate of £150 per annum, with usual residential allowances.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copy testimonials, should be sent as soon as possible to—

JOHN GIBSON, Superintendent and Secretary.

Borough of Stockton-on-Tees.

Applications are invited for the permanent position of ASSISTANT MEDICAL OFFICER OF HEALTH (Male or Female) for the Borough of Stockton-on-Tees.

The officer appointed will be required to work under the direction of the Medical Officer of Health and the School Medical Officer.

The salary will be £600 per annum, rising by two half-yearly increments of £50 to a maximum of £700. Candidates must be registered medical practitioners and possess a recognised diploma in Public Health.

The duties will be mainly in connexion with maternity and child welfare, the treatment of infectious disease, civil defence and school medical service, together with such other duties as the Medical Officer of Health may direct.

The person appointed will not be allowed to engage in private practice.

Canvassing, either directly or indirectly, will be regarded as a disqualification. The appointment may be terminated by one calendar month's notice on either side.

Applications, stating present and previous appointments, age, qualifications, and experience, accompanied by not more than two recent testimonials, must be sent, endorsed "Assistant Medical Officer of Health," not later than the 16th March, 1942, to: ERIC BELLINGHAM, Town Clerk.

Barclays Bank Chambers, 49, High-street, Stockton-on-Tees.

Surrey County Council.

Applications are invited from registered medical practitioners (Male) for the post of DEPUTY MEDICAL SUPERINTENDENT in the Surrey County Mental Hospital Service. The appointment is temporary, and will, subject to satisfactory service, continue for the further duration of the war.

Scale of salary £720, rising by annual increments of £25 to a maximum of £820 per annum. In fixing the commencing salary regard will be had to the experience and attainments of the person appointed. A house is available on the Hospital Estate, and there are no other emoluments attached to the post. In the case of a single man, board and lodging may be provided in the Hospital, in which case an appropriate adjustment of the cash salary will be made.

Candidates should preferably hold the Diploma in Psychological Medicine, or equivalent degree.

The appointment is subject to termination by three calendar months' notice on either side, and the person appointed will be required to undergo a medical examination.

Applications, stating age, and whether married or single, accompanied by copies of three recent testimonials, must reach the undersigned not later than Wednesday, the 11th March, 1942. The envelope should be marked "Deputy Medical Superintendent." DUDLEY AUCKLAND, Clerk of the Council.

Mental Hospitals Department, County Hall, Kingston-upon-Thames, 16th February, 1942.

Isle of Ely County Council.

Applications are invited for the appointment of DEPUTY COUNTY MEDICAL OFFICER AND DEPUTY SCHOOL MEDICAL OFFICER.

Candidates should have had considerable administrative experience in all branches of public health, and particularly in civil defence work.

Experience in refraction and in mental deficiency is very desirable.

Salary £700 per annum, rising by annual increments of £25 to £800 per annum, together with a travelling allowance on the Council's scale.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Canvassing, directly or indirectly, will disqualify.

Applications on a form supplied upon request, accompanied by copies of three testimonials, should reach the County Medical Officer, County Hall, March, not later than the 9th March, 1942.

R. F. G. THURLOW, Clerk of the Coun y Council.

County Hall, March, 12th February, 1942.

Royal Devon and Exeter Hospital,

EXETER.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a THIRD HOUSE SURGEON (A), to become vacant on the 21st March, 1942. R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary is at the rate of £160 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent not later than the 7th March, 1942, to—

L. PARKHOUSE, Secretary and Manager.

The Royal Cripples Hospital,

BIRMINGHAM.

(377 Beds for Acute Cases, including a proportion of Patients suffering from Tubercular Bone Disease, and large Out-patient Department.)

Applications, which should be addressed to the SECRETARY, 89, Broad-street, Birmingham, 15, are invited from registered medical practitioners, including suitably qualified R practitioners holding A posts when appointment will be limited to six months, for the appointment of RESIDENT HOUSE SURGEON (B2), vacant end of March. Resident salary £200 per annum.

Sir John Priestman,

DURHAM COUNTY AND SUNDERLAND EYE INFIRMARY.

Applications are invited for a RESIDENT HOUSE SURGEON (B2) (Male or Female). R practitioners holding A posts may apply when appointment will be limited to six months. The Infirmary is recognised by the Royal College of Surgeons as partial course of D.O.M.S. (60 Beds.) Salary commencing at £175 per annum, with board, residence, and laundry, rising to £200 per annum after the period of one year.

Applications, stating age and experience, together with copies of two recent testimonials, to be delivered to the SECRETARY, The Sir John Priestman, Durham County and Sunderland Eye Infirmary, Alexandra-road, Sunderland, not later than 15th March.

Huddersfield Royal Infirmary.

(321 Beds.)

Male CASUALTY OFFICER (B2) required to commence duty on 18th March, 1942. Salary £200 per annum, with board, residence, and laundry. Appointment for six months, subject to renewal for a similar period. R practitioners who now hold A posts are invited to apply when appointment will be limited to six months. The Hospital is officially recognised for the surgical practice required of non-members before admission to the Final Fellowship Examination of the Royal College of Surgeons of England. The post of Casualty Officer is next in seniority to that of Resident Surgical Officer.

Applications, with copies of three recent testimonials, to be addressed immediately to—

H. J. JOHNSON, General Superintendent and Secretary.

East Suffolk and Ipswich Hospital,

IPSWICH. (400 Beds.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1) to this Hospital and Medical Superintendent to the Branch Hospital (50 Beds). Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary £500.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to—

ARTHUR GRIFFITHS, Secretary

The Hospital, Ipswich, 21st February, 1942.

Essex County Council.

PUBLIC HEALTH DEPARTMENT.

Applications are invited from registered medical practitioners possessing experience of administrative work for the post of ASSISTANT MEDICAL OFFICER on the Central Staff of the Council's Public Health Department.

The duties of the officer will be chiefly to assist in the administration of hospitals, sanatoria, public assistance establishments, and the tuberculosis services of the Council.

The salary attaching to the post will be at the rate of £650 a year, rising, subject to satisfactory conduct and service, by annual increments of £25 to £700 a year, but the commencing salary may be varied, having regard to the experience and capabilities of the candidate appointed.

Forms of application may be obtained from the undersigned to whom they should be returned completed, accompanied by copies of three recent testimonials, and in envelopes endorsed "Assistant Medical Officer," not later than 9th March, 1942.

Canvassing, whether directly or indirectly, is forbidden.

JOHN E. LIGHTBURN, Clerk of the County Council.

County Hall, Chelmsford, 16th February, 1942.

Beckett Hospital and Dispensary,

BARNSLEY.

Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE PHYSICIAN (B2), to become vacant on 28th February. R practitioners who now hold A posts may apply when appointment will be limited to six months. The salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and present post, and accompanied by copies of three recent testimonials, should be sent as soon as possible to: ARTHUR L. BOURNE, Secretary-Superintendent.

2nd February, 1942.

The Corbett Hospital, Stourbridge

(212 Beds)

AND SPECIALIST OUT-PATIENT DEPARTMENTS.

Applications are invited for the post of PATHOLOGICAL LABORATORY TECHNICIAN (Male) for General Hospital Clinical Laboratory which becomes vacant on March 9th. Applicants must hold the certificate of the F. and B.L.A.A. Commencing salary at the rate of £250 per annum, plus 10 per cent. superannuation.

Applications, giving details of experience, age, and stating position with regard to military service, together with copies of three testimonials, should be sent forthwith to—

W. G. H. WESTON, House Governor and Secretary.

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City of Birmingham.

SELLY OAK HOSPITAL AND INFIRMARY. (1200 Beds.)

Applications are invited from registered medical practitioners for the appointment of TEMPORARY SURGEON (B1) (Resident). Applicants must have had experience in general surgery and ear, nose, and throat work. Suitably qualified R practitioners holding B2 or B1 posts may apply. The salary will be at the rate of £10 10s. per week, plus residential emoluments. The appointment will be terminable by one month's notice on either side. Further particulars of the appointment may be obtained from the Medical Officer of Health.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the MEDICAL OFFICER OF HEALTH, Council House, Congreve-street, Birmingham, 3, not later than the 5th March 1942.

City of Birmingham.

MATERNITY AND CHILD WELFARE DEPARTMENT.

BABIES' HOSPITAL, CANWELL HALL. (84 Beds.)

A RESIDENT MEDICAL OFFICER (B1) is required on 9th March, 1942, for a period of six months. Suitably qualified R practitioners holding B2 or B1 posts may apply. The Hospital deals with children under five years of age suffering with acute and chronic medical conditions. The Resident Medical Officer will also be required to take two child welfare sessions weekly at the Maternity and Child Welfare Centres in the City of Birmingham. Salary £350 per annum, with board, residence, and laundry.

Applications, with copies of three testimonials, to be sent on or before 25th February, 1942, to the MEDICAL OFFICER OF HEALTH, The Council House, Congreve-street, Birmingham, 3.

The Children's Hospital, Sheffield (Inc.)

(157 Beds.)

Applications are invited from registered medical practitioners Male and Female (including R practitioners within three months of qualification), for the appointment of HOUSE PHYSICIAN (A), to become vacant on the 1st March, 1942. The appointment is for a period of six months, with salary at the rate of £100 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to the undersigned. The successful candidate must be a member of a Medical Defence Society.

T. H.G. GARTLAND, Superintendent and Secretary.

The Chester Royal Infirmary.

(Normal Capacity 225 Beds.)

Applications are invited from registered medical practitioners (Male and Female) for the appointment of GENERAL HOUSE SURGEON (A), to take up duty forthwith. R practitioners within three months of qualification may apply when appointment will be for a period of six months. The vacancy has been caused by the illness of the present holder. The appointment is approved in connexion with the M.S. (London University) and the F.R.C.S. (England) examinations. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent not later than 26th February, 1942, to—

W. H. GRACE, M.D., F.R.C.P.,
Hon. Secretary, Medical Committee.

Royal Gwent Hospital, Newport, Mon.

(Total 341 Beds.)

Applications are invited from registered practitioners, Male or Female, for the appointment, which falls vacant on 28th February, of THIRD HOUSE SURGEON (A). R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, and details of previous appointments (if any), accompanied by copies of three recent testimonials, should be sent at once to: ALAN RUDDLE, Secretary-Superintendent.

6th February, 1942.

City of Birmingham Education

COMMITTEE.

An ASSISTANT SCHOOL MEDICAL OFFICER (Woman) is required to begin duty about May, 1942. Candidates must have had at least three years' experience in the practice of their profession subsequent to obtaining a registrable qualification. Salary according to "Askwith" scale (£500 to £700 by annual increments of £25). In fixing commencing salary previous service in Class II of "Askwith" scale may be taken into account; £10 per annum travelling expenses allowed.

Forms of application (to be returned not later than first post on Thursday, 12th March, 1942), together with further information, obtainable from the undersigned on receipt of stamped, addressed foolscap envelope. Communications should be endorsed "Assistant School Medical Officer." Canvassing will disqualify.

P. D. INNES, Chief Education Officer.

Education Office, Margaret-street, Birmingham, 3,
14th February, 1942.

Kent and Canterbury Hospital,

CANTERBURY. (336 Beds.)

Applications are invited from registered medical practitioners (Male or Female) for the appointment of a HOUSE PHYSICIAN (A), commencing middle of March. R practitioners within three months of qualification may apply, when appointment will be for a period of six months. Salary is at the rate of £125 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent immediately to—

J. F. KENT, Superintendent and Secretary.

17th February, 1942.

Stamford, Rutland and General

INFIRMARY.

Applications are invited from registered medical practitioners, Male or Female, for the appointment of a HOUSE OFFICER (A) to become vacant on 1st April, 1942. R practitioners, within three months of qualification may apply, when appointment will be for a period of six months. Otherwise it will be for a period of three months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent, not later than 16th March, 1941, to—

H. F. DONALD, Secretary-Superintendent.

Chesterfield and North Derbyshire

ROYAL HOSPITAL.

(460 Medical and Surgical (normal and M.S.) Beds.)

Applications are invited from registered medical practitioners (Male and Female) for the appointment of a HOUSE SURGEON (A), to commence immediately, for a period of six months. Salary £150 per annum, with full residential emoluments. The successful applicant will be required to reside in and also carry out duty at the Hospital Annexe (80 Beds). R practitioners within three months of qualification may apply.

Applications, stating nationality, age, and qualifications with dates, together with copies of three recent testimonials, should be sent as soon as possible to—

M. H. BOONE, House Governor and Secretary.

16th February, 1942.

Applications are invited from registered medical practitioners (Male) for the appointment (full time) of WORKS MEDICAL OFFICER. Minimum salary £800 per annum.

Applications, stating age, qualifications with dates, and nationality, and accompanied by three recent testimonials, should be sent to the GENERAL MANAGER, Richard Thomas & Co. Ltd., Ebbw Vale, Mon., marked "Private."

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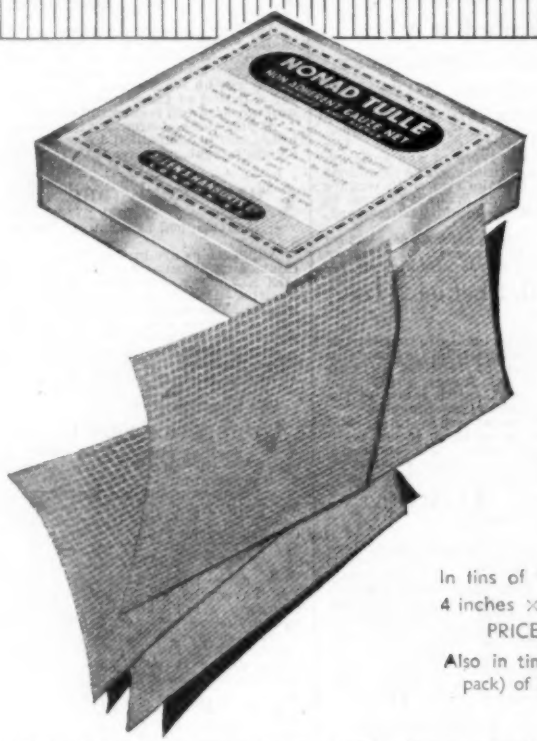

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